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DISEASES CAUSED BY BACTERIA AND FUNGI

Vallis, P. (1959). La prova di Negretti quale metodica pratica di stalla per la diagnosi di mastite catarrale cronica dei bovini. **[The Antiformin test for bovine chronic catarrhal mastitis.]** — Atti Soc. ital. Sci. vet. **13,** 708-710. [Summaries in English and French.] **3128**

The author confirmed the value of the test described by Negretti [*V.B.* **29,** 3350 & 3698]. "Antiformin" is an alkaline soln. of sodium hypochlorite.—R.M.

Rehder, H. (1960). Die Antibiotikaresistenz euterpathogener Staphylokokken. **[Resistance of mastitis staphylococci to antibiotics.]** —Tierärztl. Umsch. **15,** 120-122. **3129**

671 isolates of staphylococcus from cases of mastitis were tested against penicillin, streptomycin, chlortetracycline and oxytetracycline. Only 10 showed resistance, chiefly to chlortetracycline. All were sensitive to sulphonamides.—M.G.G.

Wallace, G. D., Quisenberry, W. B. & De Harne, M. A. (1960). **Preliminary report of human staphylococcal infection associated with mastitis in dairy cattle.** — Publ. Hlth Rep., Wash. **75,** 457-460. [Authors' summary.] **3130**

Three cows in one dairy herd were found to have mammary glands infected with the antibiotic-resistant staphylococcus phage type 80/81.

Subsequent investigations revealed one dairy employee and his family to be suffering from staphylococcal disease caused by the same type. This organism was also found in 2 of 21 raw bulk milk samples collected at the dairy.

Treatment of the human cases is described as well as the therapeutic failure in preventing the excretion of type 80/81 in the milk of one dairy cow.

Parish, H. J. & Cannon, D. A. (1960). **Staphylococcal infection: antitoxic immunity.** — Brit. med. J. March 12th, 743-747. [Authors' conclusions modified.] **3131**

Antitoxic immunity is only one factor in the control of infection. There is a close parallel between staphylococcus antitoxin and haemolytic streptococcus (scarlet fever) antitoxin in that both protect rabbits against intravenous lethal doses of culture without disposing of all the invaders: temporary recovery is followed by abscess formation in various sites.

In man, also, staphylococcal and streptococcal infections may persist in spite of procedures designed to raise the concentration of serum antibodies to the highest level. Nevertheless, staphylococcus antitoxin will prevent some fatalities from staphylococcal infection in man, and alpha toxoid may be useful in many cases of superficial infection.

The authors made suggestions for "improving" antigens and antibodies in various ways. But humoral immunity is not the full story: there is an elusive "something else," and the study of staphylococcal infection—and indeed of infection generally—"will have taken a great step forward when the nature of this other factor is brought to light."

Kapral, F. A. & Li, I. W. (1960). **Virulence and coagulases of Staphylococcus aureus.**— Proc. Soc. exp. Biol., N.Y. **104,** 151-153. [Authors' summary modified.] **3132**

Three mutants were isolated from a single strain of *Staph. aureus* of known virulence for rabbits. Two mutants, one lacking the soluble type of coagulase and the other lacking the bound type of coagulase, were still virulent for rabbits; the third, which produced both kinds of coagulase, had lost its virulence for rabbits.

Mann, P. H. (1960). **Bacteriophage typing and antibiotic sensitivity testing of staphylococci isolated from the oral cavity of dogs.** — Canad. J. comp. Med. **24,** 147-149. [Author's summary modified.] **3133**

Coagulase-positive strains of *Staphylococcus aureus,* from the oral cavity of 200 dogs, were phage-typed and also tested for susceptibility to some antibiotics.

Gogoaşă, V. & Mitroiu, P. (1960). Cercetări asupra prezenţei anticorpilor precipitanti streptococici din serul şi produsele patologice ale cailor aflaţi în focare de gurmă. **[Specific precipitins in serum and lesions from horses with strangles.]**—Probl. Epiz. vet., Bucureşti No. 9 pp. 114-124. [In Roumanian. Summaries in French and Russian.] **3134**

Precipitins to Group C streptococci were detected in 93% of sera and also in urine and nasal discharge from horses with strangles. Precipitins also occurred in 63% of sera from apparently healthy horses in infected districts and in 56% of horses with other diseases. The gel diffusion test could be used to detect precipitins.—R.M.

Weber, A. F. (1960). Über die Natur und mögliche pathologische Bedeutung von Spirillen in den Fundusdrüsen von Hunden und Katzen. **[Spirilla in fundus glands of the stomach in dogs and cats.]** — Berl. Münch. tierärztl. Wschr. **73,** 141-142. [Summary in English.] **3135**

Large numbers of spirilla were observed in the fundus glands, particularly in the parietal cells, of 8 adult dogs and 3 cats. The organisms were also found in the intestine. Mice remained normal after experimental infection.—M.G.G.

Lindqvist, K. (1960). **A Neisseria species associated with infectious keratoconjunctivitis of sheep—Neisseria ovis nov. spec.**—J. infect. Dis. **106,** 162-165. [Author's summary modified.] **3136**

From infectious keratoconjunctivitis of sheep a haemolytic *Neisseria* sp. has been isolated for which the name *Neisseria ovis* is suggested. The species is characterized by its haemolytic, non-chromogenic, and non-fermentative properties, as well as by a positive nitrate reductase test. Its role in infectious keratoconjunctivitis of sheep is not yet known.

Ewing, W. H., Davis, B. R. & Reavis, B. W. (1959). **Studies on the Serratia group.** pp. 19. Atlanta, Georgia: Communicable Disease Center. **3137**

115 cultures of human or animal origin were studied and compared with the aid of biochemical and serological tests. Of 57 type-culture strains 32 were found to belong to the Serratia group and 25 did not. Of 14 type-culture strains labelled *Chromobacterium prodigiosum* only two resembled *Serratia marcescens.*

Nine O antigens and 13 H antigens were identified.—R.M.

Pellegrini, N. (1959). Tubercolosi pancreatica del bovino. **[Tuberculosis of the pancreas in cattle.]**—Atti Soc. ital. Sci. vet. **13,** 420-421. [Summaries in English and French.] **3138**

Two cases were encountered during meat inspection.—R.M.

Meyn, A. (1960). Die Fortschritte der Rindertuberkulosebekämpfung in der Bundesrepublik (Stand vom 1.7.1959). **[Progress in the control of bovine tuberculosis in the German Federal Republic.]** — Rindertuberk. u. Brucellose **9,** 43-50. **3139**

From 1st July 1958, to 1st July 1959, 120,803 new herds containing 1,583,717 cattle were declared free from TB., an increase of 9·3% of all herds and 13·1% of all cattle. By the end of 1959, 89·4% of herds were attested. —M.G.G.

Müller-Calgan, H. (1960). Über die temporäre Maskierung bei unspezifischen Tuberkulinreaktionen in der Hochträchtigkeit und im Puerperium. Ein Beitrag zur Klärung der schwankenden Reaktionsintensität beim Rind. **[Non-specific tuberculin reactions in cows during late pregnancy and the puerperium.]** — Dtsch. tierärztl. Wschr. **67,** 236-242. [Summary in English.] **3140**

120 cattle, in 64 herds, that gave non-specific reactions to bovine tuberculin, were tested simultaneously with both bovine and avian tuberculin at intervals of a few months for 29 months or until the reactions ceased. Infection with the avian type of tubercle bacillus was stated to be the cause of the reactions in 97 animals. The reactions tended to become more pronounced in the 4th to 7th months of pregnancy, and to diminish or disappear, temporarily, in the 8th and 9th months of pregnancy and the first 8 weeks after parturition. Sterility appeared to intensify the reactions, and oestrus to depress them.

—M.G.G.

Dziąba, A. (1960). Rola siary w przekazywaniu cielętom wrażliwości na tuberkulinę. **[Transfer of tuberculin sensitivity to calves by means of colostrum.]**—Med. Wet. Warszawa **16,** 206-208. [In Polish. Summaries in English, French, German and Russian.] **3141**

No antibodies could be found either in the colostrum of cows giving a low titre (1 : 8) to the Middlebrook-Dubos test, or in the serum of their calves, but antibodies were found in the colostrum and in calves' serum where the cows gave a titre of 1 : 16 and higher. Tuberculin test (P.P.D.) in 70 calves (1–90 days old) from reactor cows was always negative irrespective of whether the cow gave a positive or negative titre to the Middlebrook-Dubos test.—M. Gitter.

Balbierz, H., Kuprowski, M., Sobiech, T. & Wachnik, Z. (1960). Gruźlica u konia wywołana prątkami typu ptasiego. **[Avian-type tuberculosis in horses.]** — Med. Wet., Warszawa **16,** 148-153. [In Polish. Summaries in English and Russian.] **3142**

An account of 3 cases of TB. in horses, two of which were generalized and one pulmonary. One of the generalized cases which gave a positive reaction to mammalian tuberculin (P.P.D.) proved to have been infected with avian type bacilli which were recovered in culture and by inoculation of 2 hens.

—M. Gitter.

Bjerkedal, T. (1960). **Degree of tuberculin sensitivity in guinea pigs infected with different doses of virulent tubercle bacilli.**— Amer. J. Hyg. **71,** 299-313. [Author's summary.] **3143**

The conclusions of this study in guinea pigs are that degree of sensitivity from a short period of time after infection is independent of the number of infecting bacilli; that the individual animal retains the same level of sensitivity from a short period after infection until the beginning of the terminal stage of tuberculous disease (when sensitivity starts to decline); and, finally, that higher degrees of resistance to tuberculosis are associated with lower degrees of sensitivity.

The findings are contrary to those of earlier corresponding animal experiments but are in line with recent clinical and epidemiologic studies in human beings.

Gray, D. F., Graham-Smith, H. & Noble, J. L. (1960). **Variations in natural resistance to tuberculosis.**—J. Hyg., Camb. **58,** 215-227. [Authors' summary modified.] **3144**

'Resistant' and 'susceptible' species of animals appear to be more or less equally susceptible to lung infection with equal doses of tubercle bacilli. Therefore it is pertinent to ask whether recognised natural differences in species resistance are in fact significant. For example, in terms of death rates (*i.e.*, of overall resistance) the C57 mouse is at least as susceptible to TB. as the g.pig and much more so than man.

Resistant, moderately susceptible and susceptible strains of mice as determined by death rates when exposed to large infecting doses, were equally susceptible to intranasal infection with small numbers of tubercle bacilli.

A state of tolerance of the parasite by the host lasting for about 3 weeks was observed in all mouse strains, regardless of ultimate strain resistance.

Pre-allergic deaths commenced in all groups when TB. left insufficient normal lung to support life, but the deaths stopped first in the resistant strain and last in the susceptible strain, coinciding approximately in each strain with the onset of allergy.

Acquired immunity, once established, appeared not to vary in quality from one mouse strain to another, at least during 3 months' observation.

Racial or strain variations in the resistance of mice to TB. are therefore natural, only in the sense that speed of onset of acquired immunity is probably genetically determined for each strain.

It is suggested that both species and racial variations in natural resistance to pulmonary infection are insignificant. Differences in the subsequent course of the disease appear to be explainable by the rapidity, efficiency and duration of the acquired immune response.

Nagy, G. & Benedek, L. (1960). A tuberkulin- és brucellin-próbák egyidejű alkalmazása. **[Simultaneous tuberculin and brucellin testing.]** — Mag. állator. Lapja **15,** 123-124 & 125. [In Hungarian. Summary in English and Russian.] **3145**

Allergic tests for TB. (tuberculin 0·2 ml. injected into the conjunctiva) and for brucellosis ("Brucergen" 0·2 ml.) were made simultaneously in 734 cattle in 6 herds. 85 animals reacted to both allergens positively, and 75 of these yielded positive serological tests for brucellosis. 101 animals reacted to tuberculin alone and 105 animals reacted to "Brucergen" alone. The history of the herds

and subsequent serological tests suggested that only those animals which were in fact infected by the corresponding disease, reacted to the respective allergens; therefore the authors considered that the simultaneous application of the two allergic tests does not influence their specificity and sensitivity.

—A. SEBESTENY.

Greenberg, L., Eidus, L. & Diena, B. B. (1960). **The production of niacin by mycobacteria.** — Canad. J. comp. Med. **24,** 187-191. [Authors' summary modified.] **3146**

A study of 54 strains of mycobacteria has confirmed that while all strains of mycobacteria can produce niacin following prolonged periods of incubation (8 weeks or more), the amount produced by the human strains is between 6 to 20 times more than that produced by the others.

The ability to produce niacin can be used along with other characteristics to differentiate between "human" and other strains of mycobacteria. A comparison of methods for the determination of niacin is outlined, and a rapid, direct qualitative method is described.

I. Perreau, P. (1960). La septicémie hémorragique des bovidés dans le Centre-Afrique Français. **[Haemorrhagic septicaemia in French Central Africa.]**—Bull. Off. int. Epiz. **53,** 116-127. **3147**

II. Dhanda, M. R. (1960). **Haemorrhagic septicaemia in India.** — Ibid. 128-132. [In English. In French pp. 133-138.] **3148**

III. Dhanda, M. R. (1960). **Haemorrhagic septicaemia. Methods of diagnosis; consideration of various techniques.** — Ibid. 173-178. [In English. In French pp. 179-185.] **3149**

IV. Kaweh, M., Sohrab, V. & Bahar-Sefat, M. (1960). **Bovine pasteurellosis in Iran. Methods of vaccination.**—Ibid. 196-202. [In English.] **3150**

I. Haemorrhagic septicaemia, due to *Past. septica,* has long been endemic in cattle in French Central Africa. Its epidemiology, geographic and seasonal incidence, clinical manifestations, bacteriology and control are discussed. An alum precipitated formolized vaccine used in 1958 and 1959 is described. It is efficacious and confers an early satisfactory immunity the duration of which, however, is uncertain though not less than 6 months—which is sufficient to protect the animals during the rainy season when the disease occurs. The vaccine is relatively simple and cheap to produce in small quantities, but is time consuming and costly to produce on a large scale. Continuous culture in liquid medium is, therefore, envisaged. Another feature for consideration is the prolongation of immunity by the use of adjuvants.

II. Haemorrhagic septicaemia, due to *Pasteurella septica,* is a serious cause of mortality in India, accounting for over 40,000 cattle annually. Epidemiology and control of the disease are discussed. Immune serum and vaccines have been used for several years but have not appreciably reduced mortality—possibly because of inadequate dosage, degradation of antigenic structure or plurality of strains. Investigation revealed that 83 strains belonged to Roberts' type I, 6 to type IV, while 13 did not conform with any of types I–V; this is important in the preparation of vaccines. An oil adjuvant vaccine confers an immunity lasting for over 2 years. Field tests were encouraging and large-scale production has been undertaken. A dried vaccine has been developed. This confers a strong, early and lasting immunity and is easy to prepare, store and use.

III. The clinical, microscopic, cultural, biological and serological procedures followed at the Indian Veterinary Research Institute for the diagnosis of haemorrhagic septicaemia are described.

IV. Haemorrhagic septicaemia is the cause of heavy mortality among cattle in Iran. Several strains of *Pasteurella septica* isolated from cattle, buffaloes, pigs and fowls were Roberts type I or Carter type B; those isolated from animals in regions where the disease is rare belonged to type I or II or were not identifiable. Good results have been achieved, in infected areas, by systematic inoculation with a vaccine prepared from lysed virulent organisms with saponin adjuvant; the duration of immunity is 1 year. The scale of vaccination has been increasing since 1938 and in 1959 the number of doses issued was 600,000. Effective control has been achieved and the disease occurs only sporadically. The preparation and testing of vaccines are described. In a comparative study it was observed that saponin was a better adjuvant than either alum or oil.—T.E.G.R.

Nørrung, V. (1960). **Pasteurella infections in calves.** — Nord. VetMed. **12,** 425-430. [In English. Summaries in Danish and German. Author's summary modified.] **3151**

Within the period 1949–1958, 46 cases of pasteurellosis in calves were diagnosed at the State Veterinary Serum Laboratory of Copen-

hagen. In each of the two following years 11 such cases were diagnosed.

Calves under 3 weeks of age developed septicaemia, while in older calves a pleuropneumonia usually developed. Four septicaemic calves had recently been moved from one farm to another.

The author studied the biochemical activity of 50 strains of *Past. septica* recovered from calves. All of them fermented sorbitol, dextrose, and saccharose, and formed indol. Streptomycin and, to a lesser degree, penicillin were found to be effective against pasteurella organisms.

For treatment, one of these antibiotics may be used in combination with pasteurella antiserum.

Pigoury, L., Bénazet, P., Courtin, A., Charny, J., Michel, C. & Chabassol, C. (1959). Étude d'une "Shigella" (Actinobacillus equuli) isolée d'un abcès d'un ganglion poplité chez un cheval adulte. Application au diagnostic sérologique de la "shigellose" des équidés. Considérations taxonomiques. **[Study of a strain of Bacterium viscosum equi isolated from a horse. Serological diagnosis of the infection in horses.]**—Rev. Cps vét. Armée **14,** 162-166. 3152

A strain of *Bact. viscosum equi* isolated from the popliteal lymph node of a horse was pathogenic for mice when given by the i/p route and for rabbits by the i/v route. Rats were resistant, and g.pigs were susceptible after X-irradiation. Repeated inoculation of 2 horses appeared to have a sensitizing effect. Agglutination titres of about 1 : 160 were found in 40 healthy horses, whereas the c.f. test was negative in these animals and positive in an experimentally infected horse.—M.G.G.

Nag, P. C., Malik, B. S., Jain, N. C. & Hajela, S. K. (1959). **In-vitro sensitivity trials of certain chemotherapeutic agents against Klebsiella pneumoniae.**—Indian vet. J. **36,** 607-610. 3153

The authors tested 6 antibiotics and 3 sulphonamides against *K.pneumoniae* [*Bact. friedländeri*] Type 19 from lambs, and used the serial plate dilution method. The lowest inhibitory concentration was 2 μg./ml. with dihydrostreptomycin, followed by 5–10 μg./ml. with oxytetracycline and tetracycline.

—R. N. Mohan.

Schoenaers, F. & Kaeckenbeeck, A. (1960). Etudes sur la colibacillose du veau. III. Essai d'immunoprophylaxie. **[Studies of colibacillosis in calves. III. Immunization.]**—Ann. Méd. vét. **104,** 117-120. 3154

Colostrum from cows immunized with a strain of *Escherichia coli* was given to 40 of 64 new-born calves infected orally with the same strain. Only 4 of these 40 calves died from colibacillosis, compared with 19 of the 24 calves that received milk only.—M.G.G.

Sweeney, E. J., Sojka, W. J. & Lloyd, M. K. (1960). **Demonstrable antigens and a toxic factor in oedema disease of swine.**—Res. vet. Sci. **1,** 260-268. [Authors' summary modified.] 3155

Extracts of 2 strains of *E. coli* reproduced a syndrome in recently weaned pigs indistinguishable from oedema disease.

Although such extracts stimulated production of agglutinins and precipitins, they did not provoke resistance to lethal doses of extract.

Serological examination of blood samples of pigs recovered from oedema disease did not reveal antibodies to the *E. coli* strains commonly associated with the disease.

Extracts rendered 'antigen free' by serological precipitation were shown to have unimpaired oedema-producing potentiality.

Sahab, K. (1960). **Studies on Escherichia coli B and L antigens by stained capsular reaction and on their occurrence as capsules.** — J. Bact. **79,** 789-793. [Author's summary modified.] 3156

A method for titration of B antibodies in OB sera of *E. coli* is presented using the stained capsular reaction test, which demonstrates capsules on organisms with B surface antigens.

Criteria for B antigens, with regard to their occurrence as envelopes and their antigenic activities after heating at 100°C., should be reconsidered since 9 out of 10 old strains and 12 recently isolated cultures were well capsulated, and 21 out of 22 O sera contained capsular antibodies.

Morphological studies by stained capsular reaction made on a small number of strains of *E. coli* and the alkalescens-dispar group suggest the possibility that certain L antigens may occur as capsular antigens.

Takács, J. & Okályi, E. T. (1960). A Salmonella inverness-szel O-antigénje tekintetében azonos Escherichia coli 21-törzs előfordulása. **[Isolation of a strain of Escherichia coli having O-antigens identical with those of E. coli strain 21 and Salmonella**

inverness.] — Mag. állator. Lapja **15,** 105-106. [In Hungarian. Summaries in English and Russian.] **3157**

A strain of *E. coli,* labelled 2594, has been isolated by the authors. Its O antigen was found to be identical with that of *E. coli* strain 21 and *Salmonella inverness.* However, it had a thermolabile agglutination-inhibiting L antigen. Biochemically it behaved like *E. coli* strain 21, except that it took 3 and 4 times as long as that strain to ferment lactose and rhamnose. It was motile in contrast to strain 21, which has no flagella.—A. Sebesteny.

Jørgensen, B. V. (1960). Betragtninger over forskellige enterobacteriaceaegruppers biokemiske relationer og antigene strukturer med saerligt henblik på differentiering ved isolation og identifikation af salmonellabakterier. **[Biochemical relations and antigenic structures of various groups of Enterobacteriaceae with special reference to isolation and identification of Salmonella.]** — Nord. VetMed. **12,** 197-229. [Summaries in English and German.] **3158**

Routine methods of bacteriological examination used at meat and food inspection are not always sufficient. J. reviewed the various media for propagation, initial isolation and differentiation of salmonella organisms, and gave an account of the nomenclature and taxonomy of the salmonella, arizona, citrobacter and proteus groups.

The possibilities were examined of using a sulphite-reduction test for biochemical differentiation of cultures on three-sugar-iron-agar medium. Among 229 salmonella cultures representing all known O-groups, 8 non-sulphite-reducing types were found (*S. abortus-equi, paratyphi A, gallinarum, pullorum, italiana, napoli, typhi-suis, medelia*); 6 other types reduced sulphite only weakly (*S. abortus-ovis, typhi, tinda, marseille, sendai, cholerae-suis*). Sulphite reduction was found also among the arizona group, but not among other members of the Enterobacteriaceae. For differentiation between the arizona and salmonella groups a two-sugar-iron-agar medium (DMJA) was formulated, containing dulcitol and mannitol (composition given). This gave clear differentiation. Serological examination in a polyvalent salmonella serum irrespective of the number of O, H or OH-antigenic factors, is an unreliable criterion for final judgment of a suspect culture. J. outlined a working method for isolation and identification of salmonella bacteria in the course of bacteriological meat and food inspection.—F.E.W.

Battelli, C. (1959). "Il nitrofurazone nel trattamento della salmonellosi suina da S. cholerae suis var. Kunzendorf. **[Nitrofurazone treatment of Salmonella cholerae-suis infection in pigs.]**—Atti Soc. ital. Sci. vet. **13,** 608-610. [Summaries in English and French.] **3159**

The drug was given in the food at a conc. of 0·02% over 5 consecutive days, in outbreaks affecting 8 farms. 61 of 150 pigs died before treatment started. Of 43 ill at the start of treatment, all except 5 recovered.—R.M.

Nielsen, B. B. (1960). **Salmonella typhi murium carriers in seagulls and mallards as a possible source of infection to domestic animals.**—Nord. VetMed. **12,** 417-424. [In English. Summaries in Danish and German. Author's summary modified.] **3160**

Having demonstrated *S. typhi-murium* in two gulls, 249 apparently healthy gulls were shot and *S. typhi-murium* was isolated from four.

At a duck-farm, specialized for mallard breeding, the organism caused high mortality among newly hatched ducklings. Infection was probably transmitted with eggs from wild mallards.

Garside, J. S., Gordon, R. F. & Tucker, J. F. (1960). **The emergence of resistant strains of Salmonella typhimurium in the tissues and alimentary tracts of chickens following the feeding of an antibiotic.**—Res. vet. Sci. **1,** 184-199. **3161**

In chicks fed chlortetracycline from one day old at the rate of 100 g./ton of ration and infected orally with a strain of *S. typhi-murium* prepared from a single colony with an initial tolerance to chlortetracycline at 20 p.p.m., organisms were recovered after 4 passages which showed up to a tenfold increase in resistance to chlortetracycline. Resistant strains persisted in survivors for as long as 14 weeks without any decline in resistance and in chicks fed no antibiotic, were still 4 times as resistant as the original strain. The increase in resistance was not accompanied by an increase in virulence. Chlortetracycline feeding halved the mortality, but the carrier rate amongst survivors was high. The resistant strains stemmed from the original sensitive strain.—A. Ackroyd.

Mikhaĭlova, R. S. & Gusev, V. S. (1960). **[Salmonellosis in wild birds in Dagestan.]**—

J. Microbiol., Moscow No. 6 pp. 110-111. [In Russian.] 3162

73 cultures were obtained from 761 birds of 79 different species examined in spring and 16 from 381 birds in autumn. Among the 59 cultures that were typed were the following serotypes: *S. abortus-equi, abortus-ovis, typhi-murium, gallinarum, paratyphi A* and *B, reading, heidelberg, london.*—R.M.

I. Stableforth, A. W. (1960). **Symposium on brucellosis. I. Introduction.**—Vet. Rec. **72,** 419-422. 3163

II. Bothwell, P. W. (1960). **Symposium on brucellosis. III. Brucellosis: An anachronism in public health.**—Ibid. 425-431. [Authors' summaries modified.] 3164

I. The only brucellosis problems in Gt. Britain are in cattle and in man infected by them.

Most are caused by *Br. abortus.* Strains with the biochemical and serological characters of classical *Br. melitensis,* but which behave like *Br. abortus* biologically in cattle, goats, and g.pigs, and are of low pathogenicity for man, are however not uncommon and may be increasing.

The use of Strain 19 vaccine has been followed by a reduction in the overall abortion rate to a little over 2%, of which less than one-sixth is caused by brucella.

The proportion of infected milk supplies has also probably decreased but is still high.

Infection from udder to udder may be commoner than suspected hitherto, especially in vaccinated animals. Strains are being isolated with characters intermediate between those of Strain 19 and typical field strains.

There are many herds free from brucella infection and others which could be freed by removal of one or a few animals.

The simplest way to do this is by Milk Ring Tests on can samples, followed by individual tests in positive herds.

For this to be practicable it is essential that Strain 19 vaccination should be carried out before the end of the eighth month of age, because of the interference with all diagnostic tests which it causes if used later.

Large-scale experiments in Gt. Britain and the U.S.A. have shown that after one dose of vaccine at 6 months of age, protection is as good at the 5th or 6th pregnancy as at the first.

II. Reference is made to the continuing incidence of human brucellosis, even with widespread pasteurization and reduced abortion in animals (consequent upon Strain 19 vaccination). This is probably mainly due to a continuing small proportion of non-pasteurized milk, and the continued excretion of field strains of *Br. abortus* in the milk of Strain 19-vaccinated animals. It is probable that unpasteurized milk is distributed quite widely in the population, since families often buy small quantities of milk other than pasteurized.

Reference is made to a survey of hospital cases over 20 years and of serological examinations by various investigators since 1927.

The information available about national and local incidence suggests that milk (usually the major infecting source in England) is increasingly the source of infection. Contact infection may have fallen off with reducing animal abortion. This is supported by the finding that milk was the source in the majority of the whole group of cases, and in at least 12 of the 17 recent cases, in the Oxford region survey, in which raw milk from tuberculin tested cows was often the source.

Deficiencies in the legal enactments relating to brucellosis are indicated. Among these, notification of the disease in man and animals appears long overdue. The several regulations relating to the disease might be brought together and clarified in new "Brucellosis Regulations." There is no justification for the view that this condition will eventually disappear without further positive action. Such preventive action implies attention to both human and animal disease.

Feiling, O. (1960). Erfahrungen bei der staatlichen Bekämpfung der Rinderbrucellose. **[Control of bovine brucellosis: rectal transmission of infection during artificial insemination.]**—Rindertuberk. u. Brucellose **9,** 11-18; 28-33. 3165

Individual cases of abortion caused by *Brucella abortus* in herds previously free from the disease were attributed to rectal infection from inadequately disinfected gloves and hands at artificial insemination or pregnancy diagnosis.—M.G.G.

Bouvier, G. (1960). Isolement de souches de Brucella d'arrière-faix positifs et négatifs à l'examen microscopique. **[Isolation of brucella from the placenta.]** — Schweiz. Arch.

Tierheilk. **102**, 211-216. [In French. Summaries in English, German and Italian.] **3166**

Brucella was isolated from 125 of 140 bovine placentas in which brucella was seen microscopically and from 4 of 250 microscopically negative placentas by the following method: shaking fragments of tissue in 0·2–0·5% solution of freshly slaked lime, allowing to stand for 15 min., centrifuging, and inoculating "W" medium with the washed sediment.—M.G.G.

I. Wilkowa, G. (1960). Próba identyfikowania bydła szczepionego S 19 i zakażonego w sposób naturalny, przy pomocy aglutynacji z serwatką mleka. [**Whey-agglutination test for the differentiation between natural brucellosis in cattle and Strain 19 vaccination titres.**]—Med. Wet., Warszawa **16**, 140-142. [In Polish.] **3167**

II. Kocowicz, I., Ratomski, A. & Wiśniowski, J. (1960). Możliwość rozróżniania bydła zakażonego brucelozą od bydła szczepionego S 19 na podstawie łącznej interpretacji wyników odczynu zlepnego i wiązania dopełniacza. [**Differentiation between infective and Strain 19 titres by combined agglutination and complement-fixation tests in bovine brucellosis.**] — Ibid. 142-148. [In Polish. Summaries in English and Russian.] **3168**

I. Twenty-four cows, 3–9 years old, were vaccinated with Strain 19 and after 6 weeks whey agglutination tests were carried out every 2 weeks and blood agglutination tests every 4 weeks. After 3 months no agglutinins could be found in whey while blood agglutination tests continued to give positive results. W. suggests that in view of the early disappearance of agglutinins from the milk of cows vaccinated with Strain 19 as against their prolonged presence in the milk of naturally infected cows, simultaneous whey and blood agglutination tests may be helpful for differentiating between natural brucellosis and the Strain 19 vaccination titres in cattle.

II. Blood samples from 5,450 adult cattle from 78 farms vaccinated with Strain 19 were tested by agglutination and c.f. tests. Although both the agglutinins and complement-fixing antibodies may persist for 9 months after vaccination a higher proportion of the animals during that time gave a positive reaction to the agglutination test only. After 9 months the c.f. antibodies disappear while the agglutinins may persist for up to 6 years after vaccination. The exceptional cases where the c.f. antibodies persisted longer than 9 months are regarded by the authors as a result of individual susceptibility to Strain 19 or of natural infection. They suggest that combined agglutination and c.f. tests may be helpful in differentiation between titres due to infection and those due to vaccination.

—M. Gitter.

Semcheva, N. S. & Goryunova, A. G. (1960). [**Stabilizer for drying and storage of brucella vaccine.**]—J. Microbiol., Moscow No. 5 p. 98. [In Russian.] **3169**

Of various stabilizers tested, the best for Strain 19-BA vaccine submitted to freeze-drying at —30°C. and stored at 4–6° for 12 months was composed of 20% sucrose and 1–3% gelatin. Sodium glutamate gave poor results.—R.M.

Prohászka, L. (1960). **Immunization of cattle against brucellosis with a new living vaccine.**] —Acta vet. Acad. Sci. hung. **10**, 229-232. [In English.] **3170**

An English version of work previously published in Hungarian [*V.B.* **30**, 1710].

—R.M.

McDiarmid, A. (1960). **The immunizing value in cattle of a killed vaccine prepared from a mucoid strain of Brucella abortus.**—Res. vet. Sci. **1**, 269-274. [Author's summary modified.] **3171**

One dose of a killed agglutinogenic antigen prepared from a mucoid strain of *Br. abortus* adsorbed by aluminium hydroxide, as described by Frahm & Lembke [*V.B.* **26**, 3107], conferred a degree of protection on cattle subsequently exposed to challenge with virulent organisms. This immunity did not, however, surpass that produced by living Strain 19 vaccine.

Taran, I. F. (1960). [**Spontaneous and experimental brucellosis in saiga antelopes.**] — J. Microbiol., Moscow No. 5 pp. 99-100. [In Russian.] **3172**

During 3 years in the Caucasus 77 females, 422 still-born calves and 285 placentas were examined by animal inoculation or by agglutination tests. *Br. melitensis* was isolated from 4 g.pigs inoculated with a mixed batch of organs from ten calves, and from a mouse inoculated with placental suspension. It was noted that F. & M. disease had caused abortion during the same period. 16 antelopes aged 7 months were infected s/c or by mouth with *Br. melitensis* Strain 548. High agglutinin titres developed. The organism

was recovered from 4 antelopes killed 33–35 days after infection and from 3 of 8 killed after 135–165 days. T. suggested that acute epidemics of abortion did not occur in the antelopes because brucella could not survive the high temperature and sunlight of the calving period in May.—R.M.

I. Kharisov, S. K. (1959). **[Double intradermal allergic test for brucellosis in sheep and goats.]**—Trudy Kazan. nauchno-issled. vet. Inst. **13,** 145-150. [In Russian.] 3173

II. Loginov, F. S. & others. (1959). **[Double intradermal allergic test for brucellosis in sheep.]** — Sborn. Rabot Sibirsk. nauchno-issled. vet. Inst. **8,** 55-60. [In Russian.] 3174

I. & II. Brucella lysate was injected into the caudal fold in a dose of 0·2 ml. Injection was repeated after 48–72 hours and the result was read 24–48 hours later. K. examined a flock of 326 sheep: 46 reacted to the first injection and an additional 36 reacted to the second. Loginov and his colleagues examined 1,000 sheep and found that the double test detected between 2 and 16% more reactors than the single test.—R.M.

I. Selivanov, A. V. & Koshukov, S. D. (1959). **[Comparison of conjunctival and subcutaneous application of Strain 19 vaccine in sheep.]** — Sborn. Rabot Sibirsk. nauchno-issled. vet. Inst. **8,** 29-40. [In Russian.] 3175

II. Selivanov, A. V., Kravets, A. T. & Kosilov, I. A. (1959). **[Field trials of the conjunctival method of immunizing sheep against brucellosis with Strain 19.]**—Ibid. 71-74. [In Russian.] 3176

I. This paper presents in greater detail work abstracted previously [*V.B.* **29,** 3744].

II. Infected flocks inoculated by instilling into the intact conjunctiva a dose of 400,000 million organisms of Strain 19 six weeks before mating were compared with flocks on the same farms inoculated intradermally at the same time.

On one farm 704 ewes were in the first group and 440 in the second. Abortion occurred in 8·6% of those inoculated conjunctivally and in 11·5% of those inoculated i/d.—R.M.

Shmuter, M. F., Lopatukhina, L. G., Sosunova, A. N. & Yastrebova, E. N. (1960). **[Comparison of brucella vaccines from Strains 19, 19-BA and M inoculated subcutaneously or by scarification.]**—J. Microbiol., Moscow No. 6 pp. 12-16. [In Russian. Summary in English.] 3177

These three vaccines are used for immunization of man in the U.S.S.R. Strain M was described by K. S. Kotlyarov [*J. Microbiol. Moscow* 1950 No. 6 p. 13]. In tests on g.pigs there was little difference between Strain 19 and its BA variant. Strain M persisted longest in the body. Dermal application [precise method not stated] of 10,000 million organisms of any of the vaccines gave as good immunity as subcutaneous injection of 1,000 million. The authors recommended dermal application of Strain 19 for human beings.—R.M.

Renoux, G. (1960). Immunisation des caprins et ovins contre la brucellose par un vaccin tué, en excipient huileux. **[Immunization of sheep and goats against brucellosis with a killed vaccine in oily excipient.]**—Rec. Méd. vét. **136,** 281-302. [Summaries in English and Spanish.] 3178

A review of previously reported trials in sheep and goats leading to the selection of formolized strain **53** H. **38** of *Br. melitensis* as the most suitable vaccine for the control of this disease. It is harmless, cheap, easy to store and use, and protects for at least 18 months.—M.G.G.

Roth, E. E. & Galton, M. M. (1960). **Isolation and identification of Leptospira hardjo from cattle in Louisiana.**—Amer. J. vet. Res. **21,** 422-427. [Authors' summary modified.] 3179

A close antigenic relationship of *L. hardjo* and *L. sejroe* in naturally and experimentally infected cattle was shown and indicates that *L. hardjo* may be responsible for the widespread occurrence of antibodies detected with *L. sejroe* antigen in cattle in the U.S.A. The data suggested that the same herd may be infected with two leptospiral serotypes; further work is needed.

Bürki, F. (1960). Orientierende Untersuchung von Tierseren auf Antikörper gegen Leptospiren mittels Mischantigen in der Komplementbindungsreaktion. I. Ausarbeitung der Technik. II. Ergebnisse im Vergleich zur Agglutination-Lysis-Reaktion. **[Mixed antigen for the complement-fixation test for leptospirosis. I. Technique. II. Results on animal sera.]** — Z. ImmunForsch. **119,** 320-332 & 333-343. [Summaries in English, French, Spanish and Russian.] 3180

The best method for preparing mixed antigen was that of Terzin [*V.B.* **26,** 3400],

in which the cultures were boiled. For testing sera from horses and cattle antigen was prepared from *L. pomona, grippo-typhosa* and *sejroe;* for pigs, *pomona* and *hyos;* for dogs, *canicola* and *icterohaemorrhagiae*. The results agreed with tests using each antigen singly. The use of mixed antigens was recommended for screening an animal population for leptospirosis.—R.M.

Davies, M. E. (1960). **Observations on leptospiral antibodies occurring in pig sera.** — J. Hyg., Camb. **58,** 243-246. [Author's summary modified.] **3181**

849 samples of pig sera from the Edinburgh and Belfast areas were tested for antibodies to *L. canicola, icterohaemorrhagiae, pomona, ballum, sejroe, grippo-typhosa, hyos* and *bataviae*. Positive results were obtained in 57 samples to all except the last three serotypes.

Sleight, S. D., Langham, R. F. & Morter, R. L. (1960). **Experimental leptospirosis: the early pathogenesis of Leptospira pomona infection in young swine.**—J. infect. Dis. **106,** 262-269. [Authors' summary modified.] **3182**

30 young pigs were used to study the pathogenesis of infection during 14 days following inoculation of live organisms.

Demonstrable microscopic renal lesions were present by the 4th day. These consisted primarily of an intertubular leucocytic infiltration with lymphocytes predominating. Only minor degenerative changes were observed, and kidney function was apparently normal.

Gross kidney lesions, consisting of greyish-white foci on the cortical surface, appeared on the 7th day and were extensive by the 9th.

Microscopic brain lesions were present at 11 days. The meningoencephalitis was characterized by perivascular lymphocytic infiltrations in the cerebrum.

Haematological values differed only slightly from normal. Serological and clinical findings substantiated previous experimental evidence.

Pigs appear clinically to adapt themselves quite readily to *L. pomona* infection and this further enhances their ability to serve as carrier animals.

Broom, J. C. & Coghlan, J. D. (1960). **Leptospira bratislava isolated from a hedgehog in Scotland.** — Lancet, June 18th, 1326-1327. [Authors' summary.] **3183**

The first isolation of *Leptospira bratislava* in Britain is reported. It was cultured from the kidneys of a hedgehog caught near Edinburgh. This organism, which is closely related to *L. australis A,* is the type most commonly found in hedgehogs in Czechoslovakia.

Söderlind, O. (1960). Isolering av Vibrio fetus från sperma och preputium hos tjur. **[Isolation of Vibrio fetus from semen and prepuce of bulls.]**—Nord. VetMed. **12,** 170-183. [In Swedish. Summaries in English and German.] **3184**

In an experimental control plan for *V. fetus* infection in cattle in Sweden during the last 4 years, based on serological examination of vaginal mucus samples in combination with hygienic precautions during service, good progress has been achieved, but eradication within a reasonable period, particularly from artificial insemination centres, was improbable without direct detection of infected bulls. For this the State Institute of Veterinary Medicine (S.V.A.) relies on culture of both semen and preputial washings, with biochemical tests for specific identification. Usually the samples are sent by air and as a rule are dealt with on the day they are taken. Full details of the various techniques are given.

Of the 209 bulls (255 samples) so investigated up to September 1959 from 33 herds including 8 A.I. stations, 37 (from 9 herds including 3 A.I. stations) yielded *V. fetus* in culture; with 14 of the 209 bulls fresh cultures had to be made because of heavy contamination mainly with pseudomonas; *V. fetus* was isolated from 2 after a second attempt and from a third after the fifth attempt. In most cases positive bulls still gave positive results on re-examination. The advantage of using several plate cultures for each sample was apparent: 8 of the positive bulls yielded only single cultures; in one case (plates sown 2 hours after taking of sample) 3 colonies were found on 10 plate cultures, and in 2 others (samples taken 7 hours previously) 3 colonies on 7 plates and 1 colony on 3 plates respectively. From 3 bulls 1–3 colonies were isolated despite luxuriant growth of saprophytes. A heifer in oestrus was inoculated intracervically immediately after insemination from a clean bull, with the one catalase-negative strain isolated, to test the stability of this property after animal passage: the strain was recovered from the vagina after 4 days and was still catalase-negative. At slaughter 2 months after inoculation the foetus was normally developed and

the genital organs bacteriologically negative.

Samples from a bull yielding luxuriant growth of colonies on culture 2 hours after they were taken yielded 80% fewer colonies 12 hours after, and on culture at 24 hours only a few colonies. 24 strains including the catalase-negative strain agglutinated the S.V.A. standard serum 37.—F.E.W.

Florent, A. (1959). Les deux vibrioses génitales: la vibriose due à V. fetus venerialis et la vibriose d'origine intestinale due à V. fetus intestinalis. **[The two types of genital vibriosis in cattle, caused by venereal and intestinal vibrios.]**—Med. Veeartsenijschool Ghent **3,** No. 3 pp. 60. [In French. Summaries in English, German and Dutch.] **3185**

F. amplified and extended his previous publications on this topic [*V.B.* **28,** 2780 & **29,** 3765].—R.M.

Vandeplassche, M., Geurden, L., Van den Wyngaert, M., Snoeck, G. & De Vos, A. (1960). Puerperale Septikämie und Toxämie des Schweines. **[Puerperal septicaemia and toxaemia in pigs.]**—Dtsch. tierärztl. Wschr. **67,** 375-377. [Summary in English.] **3186**

Features of 30 cases studied at the Ghent veterinary school were described. Most of the results have already been published by Snoeck [*V.B.* **29,** 3722].—R.M.

Chadwick, P. & Slade, J. H. R. (1960). **Identification of bacteria by specific antibody conjugated with fluorescein isothiocyanate.**—J. Hyg., Camb. **58,** 147-156. [Authors' summary modified.] **3187**

The reaction of slowly-growing pathogenic bacteria with specific fluorescent antibody provided a means for their rapid identification. Fluorescein isothiocyanate was used to label the globulins of antisera as it had a number of advantages over fluorescein isocyanate.

Micro-colonies of *Br. suis, Past. tularensis* and *Past. pestis,* when treated with homologous labelled antiserum, fluoresced brightly under ultra-violet light and the individual bacteria were sharply defined and stained at the periphery.

Micro-colonies of these and other bacteria stained with normal labelled serum, or heterologous labelled antiserum, showed either very dim fluorescence under ultra-violet light, with poor definition of individual bacteria, or no fluorescence at all.

The technique described permitted specific identification of *Br. suis, Past. pestis* and *Past. tularensis* within 20 hours of inoculation of agar plates with material suspected of containing one of these organisms.

Record, B. R. & Taylor, R. (1960). **Survival of bacteria on drying in sugar/protein mixtures.**—Nature, Lond. **185,** 944. **3188**

Viability of dried bacterial cultures is low in the presence of sugar or protein alone but high in suitable mixtures of the two. The action of such mixtures is ascribed to osmotic forces, different molecular weights of sugars and of proteins, permeability of the bacterial cell wall to sugars and impermeability to proteins. In such mixtures the component with the low molecular weight protects the bacterial cell wall during the drying process while that with the high molecular weight protects it during reconstitution.—T.E.G.R.

Kral, F. & Uscavage, J. P. (1960). **Cutaneous candidiasis in a dog.** — J. Amer. vet. med. Ass. **136,** 612-615. [Authors' summary modified.] **3189**

Chronic granulomatous dermatitis in a 7-year-old female Boxer was attributed to infection by *Candida albicans.* Pure cultures were obtained using Sabouraud's glucose agar. Sodium bismuth triglycollamate and nystatin therapy was partly successful.

Hajsig, M. & Čuturić, S. (1960). **Hyaluronidase in yeast-like fungi isolated from material of animal origin.**—Vet. Arhiv **30,** 61-64. [In English. Summaries in Croat and German.] **3190**

In cultures containing potassium hyaluronate as substrate, hyaluronidase was demonstrated in *Candida tropicalis, C. krusei, C. guilliermondii, Torulopsis candida, Rhodotorula rubra* and *Rh. mucilaginosa* isolated from animals with clinical infection.—M.G.G.

Manktelow, B. W. (1960). **The in vitro activity of griseofulvin on some dermatophytes of veterinary interest.**—N.Z. vet. J. **8,** No. 2 pp. 23-27. [Author's summary modified.] **3191**

Microsporum canis, M. distortum, M. gypseum, Trichophyton mentagrophytes, and *T. verrucosum* are all extremely sensitive to griseofulvin. The minimum inhibitory concentration of griseofulvin for *Keratinomyces ajelloi* is at least four times that of the other dermatophytes tested. The fungistatic effect of griseofulvin is reversible and its activity is directed towards that part of the mycelium

with which it is in direct contact. The possibility of the emergence of antibiotic resistant strains is discussed.

Bisping, W., El-Fiki, A. Y. & Rieth, H. (1960). Infektionsversuche mit Dermatophyten beim Schwein. **[Experimental ringworm in pigs.]** — Zbl. VetMed. **7**, 498-508. [Summaries in English, French and Spanish.] **3192**

Four areas of skin about 7 cm. diam. were scarified on each of 7 pigs aged 2–3 months. Cultures of 8 dermatophytes were applied singly to the scarified areas, and application was repeated 8 and 18 days later. Observations were made at intervals up to 2 months after the first application. Only 3 fungi caused lesions: *T. mentagrophytes, M. gypseum* and *M. canis*. The lesions tended to disappear spontaneously. Those which did not cause lesions were: *T. verrucosum, tonsurans, quinckeanum, M. audouini* and *M. distortum*. —R.M.

Szécsényi, I. (1960). Baromfi bőr- és tollfavusa. **[Skin and feather favus in fowls.]** —Mag. állator. Lapja **15**, 129-132. [In Hungarian. Summaries in English and Russian.] **3193**

In a flock of 20 hens the symptoms included feather picking, flour-like material on the appendages, the skin and the feathers, and severe loss of feathers, while condition, appetite and production did not seem to be affected. All of 40 chicks placed in contact with the hens developed the condition in 3 months, but grew normally. No evidence of deficiency disease could be found. From the surface of skin and feathers *Achorion (Trichophyton) gallinae* was isolated and the condition was transmitted experimentally to healthy fowls, pigeons and g.pigs. Treatment of 10 birds by dipping in 0·5% pentachlorphenol solution gave satisfactory results. Enquiry revealed no predisposing factor, and the author presumed that it was a case of infection with an unusually virulent strain of *T. gallinae*.—A. Sebesteny.

Ellis, M. B. (1960). **Dematiaceous hyphomycetes: 1.** [with reference to synonymity of Sporidesmium and Pithomyces.—Ed.] pp. 36. Kew: Commonwealth Mycological Institute. Mycological Paper No. 76. 10s. **3194**

The author cites the fungus associated with facial eczema, *Sporidesmium bakeri* Sydow, as a synonym of *Pithomyces chartarum* (Berk. & Curt.)/M. B. Ellis. The latter is therefore the valid name for this fungus. Collections from several species of plants were examined from many tropical and sub-tropical countries, including New Zealand and Queensland in Australia. It is not definitely stated that any of the isolates examined were associated with outbreaks of facial eczema.—P. K. C. Austwick.

Thornton, R. H. & Sinclair, D. P. (1960). **Some observations on the occurrence of Sporidesmium bakeri Syd. and facial eczema disease in the field.**—N. Z. J. agric. Res. **3**, 300-313. [Authors' summary.] **3195**

The incidence in pastures of the spores of *Sporidesmium bakeri*, observed to grow saprophytically on dead pasture-plant material, has been studied with a simple spore-counting method.

High spore counts were favoured by large amounts of dead and damaged plant materials and warm, moist conditions.

A relationship has been established between relatively high counts of spores and facial eczema disease in lambs.

Stoenescu, V., Surdan, C. C., Stanescu, M., Sandulescu, S. & Vior, C. (1960). Semnalarea bolii respiratorii cronice la păsări în R.P.R. **[Chronic respiratory disease of fowls in Roumania.]**—Probl. Epiz. vet., Bucureşti No. 9 pp. 56-68. [In Roumanian. Summaries in French and Russian.] **3196**

The disease was detected in a batch of cockerels imported in April 1959 from Canada. Strains of PPLO were isolated and the disease was experimentally reproduced.—R.M.

Bryant, M. P. & Small, N. (1960). **Observations on the ruminal microorganisms of isolated and inoculated calves.**—J. Dairy Sci. **43**, 654-667. [Authors' summary modified.] **3197**

A study was made of the micro-organisms in the rumen of three calves inoculated with whole rumen contents from a mature cow, and of two uninoculated calves similarly fed but kept strictly isolated from other ruminants immediately after birth. Data were compared with data previously obtained on normally reared calves. Inoculation of normally reared calves had little effect on the time of establishment of predominant culturable bacteria typical of mature cattle, but allowed ciliate protozoa to become established at an earlier age.

When calves were isolated from other ruminants to a far greater degree than is

likely under farm conditions, the bacterial flora was modified during the first 17 weeks of age, as indicated by bacterial counts, kinds of predominant bacteria cultured, and an apparent effect of inoculation on the flora after 17 weeks of age. Some groups of typical ruminal bacteria were present.

In the two isolated calves the lack of a normal microbiological population had no drastic effect on food consumption, growth, or health up to the end of the 17th week of age.

Seamer, J. (1960). **Studies with Eperythrozoon parvum Splitter, 1950.**—Parasitology **50**, 67-80. [Author's summary modified.] **3198**

The staining and morphology of *E. parvum* were characteristic of the genus *Eperythrozoon*. The diameter of the organism was approx. 250 mμ. Visible organisms disappeared in 20 min. from infected blood incubated at 56°C., and in 12 hours at 37°C. They persisted for several days at room temp. *E. parvum* was preserved for short periods at 5°C. and for longer periods at —30° and —79°C.

Splenectomized early-weaned piglets were infected by the parenteral and oral routes, and by means of the pig louse *Haematopinus suis*. The mean prepatent period in splenectomized pigs was 9·7 days. Patent infections sometimes persisted for at least 36 days. One pig remained a carrier of *E. parvum* for 23 months.

A severe anaemia occurred in splenectomized piglets affected with *E. parvum*, but intact piglets were apparently unaffected.

E. parvum was susceptible *in vivo* to neoarsphenamine and oxytetracycline, but not to sulphadimidine, penicillin or streptomycin.

See also absts. **3443** (report, Bahamas); **3444** (report, Netherlands); **3445** (report, Montana).

DISEASES CAUSED BY PROTOZOAN PARASITES

Anon. (1960). **Gt. Britain. Tsetse fly and Trypanosomiasis Committee Report for 1958-1959.** London: Colonial Office. 22 pp. **3199**

The report comprises the East African Trypanosome Research Organisation and that of West Africa and also the activities of the Territorial Departments.

In East Africa until recently research was directed against the tsetse fly. Much information on these has been accumulated for planning control schemes as well as a better understanding of the mechanism of transmission and persistence of the disease. Later knowledge, however, has led to changes of emphasis chiefly as to the benefit of utilizing more efficient drugs.

These drugs have in the last ten years opened up the possibility of keeping productive cattle in areas only slightly infected with tsetse fly. Complete elimination of the flies has become unnecessary.

Studies on the ovaries of tsetse flies have been made with the object of estimating the age of the flies. Thirty-three publications by the staff are listed.

Work in the Western Institute was handicapped by shortage of staff. In chemoprophylaxis and chemotherapy, work continues on attempts to produce a form of ethidium suramin complex which will cause less serious injection-site reactions. A possible technique has been worked out for the measurement of drug resistance which depends on the fact that in a batch of infected animals a subcurative dose of the drug will clear the blood for a much shorter time if the strain is resistant to that drug, than if it is not. Drug resistance may, therefore, be measurable by comparison between periods between treatment and relapse.

Twenty-five publications were issued by the staff.

In the Territorial Departments widespread research continued in chemoprophylaxis and chemotherapy of trypanosomiasis, particularly in cattle. New drug formulations emerged and more effective techniques in using older drugs were devised.

—D. S. Rabagliati.

Ingram, D. G. & Soltys, M. A. (1960). **Immunity in trypanosomiasis. IV. Immuno-conglutinin in animals infected with Trypanosoma brucei.**—Parasitology **50**, 231-239. [Authors' summary modified.] **3200**

In rabbits infected with *T. brucei* 'M' variant, immuno-conglutinin appeared within 7 days after infection and reached its peak titre within 30 days. In rabbits infected with the more virulent 'R' variant, immuno-conglutinin levels rose more rapidly and reached peak titres within 10–14 days.

In the sera of rabbits and cats infected with trypanosomes high levels of immuno-conglutinin are detectable before a significant amount of neutralizing antibody is produced.

This difference is most marked in animals infected with the antibody-resistant variant 'R' which is more virulent for rabbits.

In animals treated effectively the immuno-conglutinin level dropped to its preinfection level, while the titre of neutralizing antibody only decreased to a slightly lower level.

No change in the titres of immuno-conglutinin and neutralizing antibody was observed after treatment of animals infected with a drug-resistant strain.

These results are very promising for further field trials and introduce a new approach and method for testing the efficiency of chemotherapy in trypanosomiasis.

Lapierre, J., Rousset, J.-J. & Picot, H. (1960). Réceptivité du hérisson (Erinaceus europaeus) au Trypanosoma gambiense. **[Susceptibility of hedgehogs to Trypanosoma gambiense.]**—Ann. Parasit. hum. comp. **35,** 188-189. **3201**

Nine hedgehogs were inoculated with large and small doses of typanosomes, i/p or s/c. The findings of Brumpt & Wurtz (1904) were confirmed. In 8 cases the infection was acute with death in 5–12 days, but one hedgehog lived 41 days; P.M. examination revealed concurrent infection with *Borrelia crocidurae* in this case.—R.M.

Weinman, D. (1960). **Cultivation of the African sleeping sickness trypanosomes from the blood and cerebrospinal fluid of patients and suspects.**—Trans. R. Soc. trop. Med. Hyg. **54,** 180-190. [Author's conclusions modified.] **3202**

By a method described both *T. gambiense* and *T. rhodesiense* were readily cultivated from blood or spinal fluid of patients.

The method was sensitive, detecting blood and spinal fluid infections not revealed by current diagnostic procedures. Thus, about 20% of "negative suspects" from an epidemic area were shown to be infected. Conventional methods were particularly poor for c.s.f. examination, detecting only 10% of those obtained by culture.

The method is reliable. There was no evidence that trypanosomes failed to grow in pure culture. However, under African field and hospital conditions, many cultures were inconclusive because of contamination.

This method of culture provides an independent means for estimating the accuracy of conventional diagnostic methods, which are often in error, and always in the one direction: that of underestimation. Accordingly, certain earlier investigations require re-evaluation. The culture method should be a useful tool for the investigation of problems which have hitherto resisted analysis.

Robertson, M. (1960). **The antigens of Trichomonas foetus isolated from cows and pigs.**—J. Hyg., Camb. **58,** 207-213. [Author's summary modified.] **3203**

The serological properties of the two strains of *Tr. foetus* (strain B and strain M) isolated from uterine infections in cows in Belfast and in northern England, respectively, and two strains isolated from the caecum of pigs were investigated with rabbit antisera to each of the four strains by direct agglutination and by precipitation of a saline extract of the dried organisms in tubes and in gel-diffusion plates.

There was considerable cross-reaction between the four strains. By the use of predominantly polysaccharide fractions from strains B and M and the predominantly protein fraction TF 4 from strain B, the polysaccharide complex of lines could be distinguished from the protein lines.

The major protein antigens were common to all four strains, but the major polysaccharide antigens were only partly shared.

The cow strains B and M were readily distinguished from each other but had a variable though slight serological relationship. The two pig strains were very closely related to each other but were not identical. Cross-reaction revealed relationship between the cow and the pig strains. The cow strain B was more closely related than the M strain to the pig strains.

The serological distinctions do not justify the separation of the pig and the cow strains of *Tr. foetus* into two species.

Hibler, C. P., Hammond, D. M., Caskey, F. H., Johnson, A. E. & Fitzgerald, P. R. (1960). **The morphology and incidence of the trichomonads of swine, Tritrichomonas suis (Gruby & Delafond), Tritrichomonas rotunda, n.sp. and Trichomonas buttreyi, n.sp.**—J. Prot. **7,** 159-171. **3204**

A full account of work previously published in brief [*V.B.* **30,** 80].—R.M.

Leclère, J. (1960). La trichomoniase du pigeon en Creuse. Essai de traitement par l'aminonitrothiazole. **[Treatment of trichomoniasis in pigeons with aminonitrothiazole.]** — Rec. Méd. vét. **136,** 399-402. [Summaries in English and Spanish.] **3205**

In an area where trichomoniasis recurred annually causing heavy losses of squabs, a 0·3% solution of aminonitrothiazole (soluble powder) in the drinking water cured the condition clinically in 10 days in 24 infected adult racing pigeons. The birds were kept in during treatment, which was given outside the breeding season. Further work is needed to confirm destruction of the parasites and to ascertain the effect of treatment of adults on the disease in their young.

In 10 experimentally infected farm pigeons (1½ months old) individual daily treatment for 8 days with 5% acetyl aminonitrothiazole, in a dosage of 20 mg. per day, cured the infection. Direct microscopic examination of mucus from the buccal cavity revealed no trichomonads on the 9th day, and no lesions were found at P.M. examination of 3 of the birds.—F.E.W.

Freudiger, U. (1960). Lambliase beim Chinchilla. **[Enteritis associated with Giardia in chinchillas.]**—Kleintier-Praxis **5,** 59-60. **3206**

Among 32 chinchillas submitted for P.M. examination at the small-animal clinic of Bern University 6 had Giardia enteritis and 6 had enteritis of unknown origin. Causes of death in the remainder are listed.—R.M.

Marquardt, W. C., Senger, C. M. & Seghetti, L. (1960). **The effect of physical and chemical agents on the oocyst of Eimeria zurnii (Protozoa, Coccidia).**—J. Prot. **7,** 186-189. [Authors' summary modified.] **3207**

The effects were studied of solar radiation, temperature, relative humidity (r.h.), centrifugation, oxygen, pH, and certain chemical agents on the sporulation of oocysts of *Eimeria zürni* of cattle. Of chemical agents and bactericides tested, only $HgCl_2$ had high activity against unsporulated oocysts. Extreme pH values of 1 and 13 did not alter sporulation. Oocysts required at least 10% of the normal amount of oxygen to sporulate at a normal rate. Physical factors found to be lethal for *E. zürni* were: sunlight for as short a time as 4 hours, drying at 25% or less r.h., and freezing below about —7°C. Survival was directly proportional to r.h., but no correlation was found with time or temperature.

Normal sporulation occurred from about 8° up to 32·5°C. Below 12° the time required for sporulation was exceedingly long, and at 35° sporulation was morphologically abnormal. The optimal temp. for sporulation was about 30° and some organisms completed the process in 23 hours. 50% of the oocysts required 65 hours to begin sporulating at 20° and 36 hours at 25°C.

Davis, L. R., Herlich, H. & Bowman, G. W. (1960). **Studies on experimental concurrent infections of dairy calves with coccidia and nematodes. III. Eimeria spp. and the threadworm, Strongyloides papillosus. IV. Eimeria spp. and the small hairworm, Trichostrongylus colubriformis.** — Amer. J. vet. Res. **21,** 181-187 & 188-194. **3208**

One experiment compared the pathogenic effects on calves of infection with (a) *Eimeria* spp. (6,000 sporulated oocysts/lb. body wt.), (b) 200,000–400,000 *Strongyloides* larvae and (c) a mixed infection consisting of half the numbers of infective organisms given to animals in groups a and b. Infection with nematodes plus coccidia (group c) increased the number of oocysts in the faeces as compared with those in group a.

A similar experiment using calves surviving from the first experiment failed to show an increased production of oocysts after mixed infection. There was, however, resistance to re-infection with coccidia.

A further experiment tested the effect of concurrent infection with *Eimeria* spp. and *Trichostrongylus colubriformis,* as compared with infection with *Eimeria* alone. It appeared that the presence of the nematodes enhanced the pathogenicity of the infection and could increase the numbers of oocysts excreted.—S. B. KENDALL.

Kazakov, I. F. (1959). **[Functional state of the brain of horses with piroplasmosis.]**—Trudy Kazan. nauchno-issled. vet. Inst. **13,** 303-320. [In Russian.] **3209**

On the basis of reactions to conditioned reflexes, three phases of change in cerebral function were distinguished in horses experimentally infected with *Babesia caballi* by means of ticks; corresponding to the incubation period, the period of illness, and the commencement of recovery. During the period of illness there was weakening or total loss of positive conditioned reflexes. Caffeine therapy at this stage had a beneficial effect in restoring nervous equilibrium.—R.M.

Lucas, J. M. S. (1960). **The chemotherapy of experimental babesiasis in mice and splenectomized calves.** — Res. vet. Sci. **1,** 218-225. [Author's summary modified.] **3210**

A test for screening compounds against *B. rodhaini* in mice is described and the

activity of a new compound, 3 : 3'-diamidinocarbanilide di-isethionate (M & B 5062A), against this parasite is compared with that of some compounds commonly used in the treatment of babesiasis.

The course of the infection produced in splenectomized calves by the inoculation of *B. divergens* is described and the results are given of treatment with a number of compounds. M & B 5062A showed good activity when inj. s/c at 5 mg./kg. and it was tolerated by calves at a dose of 40 mg./kg.

Brock, W. E., Pearson, C. C., Kliewer, I. O. & Jones, E. W. (1960). **The relation of treatment to hematological changes in anaplasmosis.**—Proc. 63rd Meet. U.S. Livestock Sanit. Ass. San Francisco, 1959. pp. 61-67. [Authors' summary modified.] 3211

Anaplasmosis may be divided into four stages: incubation, developmental, convalescent and carrier on the basis of changes in the circulating blood. Cases of acute anaplasmosis are seen in the developmental and convalescent stages. The developmental stage is characterized by increasing numbers of anaplasma infected erythrocytes and progressive normocytic normochromic anaemia. The convalescent stage is characterized by decreasing numbers of infected erythrocytes and macrocytic anaemia with all the changes indicative of stimulated haematopoiesis.

The tetracycline drugs appear to be effective in acute anaplasmosis only when used in the development stage. In order to be of any value in decreasing the mortality, the haematinic drugs should be used during the development stage. The benefits derived from any treatment, including the present methods of blood transfusion, used during the convalescent stage must be judged against the dangers of excitement, exertion, damage by the treatment itself and against the fact that signs of recovery are already present.

Guillo, B. & Desmonts, G. (1960). Diagnostic sérologique de la toxoplasmose. Essai d'application aux animaux de boucherie. [**Serological survey of toxoplasmosis in slaughter animals.**] — Rec. Méd. vét. **136,** 383-398. [Summaries in English and Spanish.] 3212

Of 416 sera from two Paris abattoirs, 160 reacted in the dye test for toxoplasma infection; reactors were 117 of 165 sheep, 27 of 93 pigs, 9 of 94 horses and 3 of 64 cattle. Dye tests regularly performed on the (initially negative) sera of experimentally infected animals (a mare, a heifer, 2 sheep and 2 piglets) revealed highest reactivity in sheep, with titres as high as 1/2,000 at 25 weeks after infection; a pig infected young could retain an important titre during the whole of its economic life; the cow developed a high titre which fell much more rapidly than in other species; the mare was the least reactive.

—F.E.W.

Garnham, P. C. C. & Lainson, R. (1960). **Sheep as a potential reservoir of toxoplasma for man.**—Lancet, July 9th, 71-74. [Authors' summary modified.] 3213

Five lambs became infected with a sheep strain of *Toxoplasma gondii* after intravenous inoculations (two), intraperitoneal inoculation (one), and inhalation. Administration by mouth was unsuccessful. A control animal remained uninfected.

The dye test became positive within 2 weeks, and it was still positive 9 months after infection.

The organism persisted in low density in the brain, skeletal and heart muscle, liver, and kidney.

Even gross undercooking of the meat killed the organism. Thus, in the ordinary way, eating infected meat does not constitute a hazard to man in Gt. Britain.

I. Beattie, C. P. (1960). **Epidemiology of toxoplasmosis.**—Proc. R. Soc. Med. **53,** 108-111. 3214

II. Beverley, J. K. A. (1960). **Congenital toxoplasma infections.**—Ibid. 111-113. 3215

III. Ludlam, G. B. (1960). **Laboratory diagnosis of toxoplasmosis.**—Ibid. 113-116. 3216

I. A summary of the species susceptible to toxoplasma and variations in incidence of infection in different areas. The means by which the infection may be transmitted is discussed.

II. An account of the spread of *Toxoplasma gondii* in the human foetus and the lesions that may result. Congenital infection may result in abortion but, depending on the age of the foetus and on the organs parasitized, the infant may survive with symptoms recognizable at birth or that may not be recognized for some years. Female mice, rats and rabbits may be infected before pregnancy and foetal infection occur in subsequent pregnancies, but not all the young are infected and it is pointed out that an infected woman may have normal children after an infected child. Reference is made to abortion in ewes associated with toxoplasma infection.

III. It is possible to diagnose toxo-

plasmosis in the laboratory by isolation of the organism or on histological changes in lymph node biopsy material, but serological tests are more reliable and have a wider application. The dye test is more sensitive than the complement-fixation test but has technical difficulties. It is possible that the antigen coated tanned red cell test may prove to be more dependable.—W. E. PARISH.

Eyles, D. E. & Coleman, N. (1960). **Effect of metabolites on the antitoxoplasmic action of pyrimethamine and sulfadiazine.**—Amer. J. trop. Med. Hyg. **9,** 277-283. [Authors' summary modified.] 3217

Para-aminobenzoic acid completely antagonized the effect of sulphadiazine (S) and partly antagonized that of pyrimethamine (P) in toxoplasmosis in mice. Folic acid partly antagonized S, but not P. It also had no effect when the drugs were given in combination. Folinic acid had no action on the effect of the drugs.

Thils, E., Deom, J. & Fagard, P. (1960). Considérations sur la sarcosporidiose au Katanga (Congo belge). **[Sarcosporidia in animals in Katanga.]**—Bull. Soc. Pat. exot. **53,** 106-110. 3218

Heart muscle from slaughtered animals was examined microscopically. Sarcosporidia were seen in 111 of 203 cattle over 2 years old, 2 of 51 cattle less than 2 years old, none of 58 pigs, 7 of 13 sheep and 4 of 8 antelopes. Morphology of the organisms was described. —R.M.

See also absts. **3443** (report, Bahamas); **3446** (book, diagnosis of protozoal diseases of animals).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Vuillaume, R. (1960). La fièvre aphteuse en France au cours de l'année 1959. Moyens de défense mis en place pour l'avenir. **[Prophylaxis of foot and mouth disease in France in 1959 and in the future.]**—Rec. Méd. vét. **136,** 245-278. [Summaries in English, German and Spanish.] 3219

In 1959 there was a further decrease in outbreaks of F. & M. disease in France; 6,198 were reported, compared with 14,127 in 1958 and 99,424 in 1957. Endemic infection is present in 3 regions (Massif Central, Seine-Maritime, Vendée) and is a threat to the rest of the country. Regular vaccination in these regions is recommended.—M.G.G.

Schmidt, D. & Heinig, A. (1960). Untersuchungen über die Anwendbarkeit der partiellen Komplementbindungsreaktion zur Typendifferenzierung bei Maul- und Klauenseuche. **[Partial complement-fixation test for type differentiation of foot and mouth disease virus.]** — Arch. exp. VetMed. **14,** 452-468. 3220

The test previously described by Schmidt (*Arch. exp. VetMed.* **12,** 948) utilizes fixation by the C^1 4 component of complement alone. It was designed to overcome low sensitivity of the test due to the C^1 3 component. In the present paper the technique was simplified by reducing the number of tubes in each set from 14 to 5. It was not possible to replace photometric reading of the results by direct visual reading. However, the modified test gave much better results than the ordinary c.f. test. —R.M.

Campbell, C. H. (1960). **The susceptibility of mother mice and pregnant mice to the virus of foot-and-mouth disease.**—J. Immunol. **84,** 469-474. [Author's summary modified.] 3221

Experiments revealed that certain pregnant mice and mother mice nursing young were susceptible to F. & M. disease virus produced in cultures of bovine kidney cells. Removal of the young 1 or 2 days before inoculation decreased the susceptibility of the mother mice. Regardless of the amount of virus inoculated, about 40% to 70% of the mothers were susceptible, whereas others displayed no sign of infection.

Heatley, W., Skinner, H. H. & Subak-Sharpe, H. (1960). **Influence of route of inoculation and strain of mouse on infectivity titrations of the virus of foot-and-mouth disease.**—Nature, Lond. **186,** 909-911. 3222

Mice were more susceptible to i/m than to i/p infection. Three strains of mice were more susceptible, and two were less susceptible than the Pirbright P strain.—R.M.

Graves, J. H. & Cunliffe, H. R. (1960). **The infectivity assay of foot-and-mouth disease virus in swine.**—Proc. 63rd Meet. U.S. Livestock Sanit. Ass. San Francisco, 1959. pp. 340-344. [Authors' summary modified.] 3223

A technique for titration of F. & M. disease virus in pigs by inoculation of the feet is described. Validity for the procedure was based on a comparison of different routes of inoculation which showed that virus could be detected in higher dilution by foot inoculation

than by intramuscular, intranasal, subcutaneous, or intravenous routes. Application of the procedure in comparison of viruses of different types and subtypes indicated quantitative differences in infectivity. The application of the technique to F. & M. vaccine studies in pigs is noted.

Kokles, R. (1960). Experimentelle Untersuchungen über das Verhalten des Maul-und-Klauenseuche-Virus im Organismus des Frosches (Rana esculenta). **[Behaviour of foot and mouth disease virus in the frog.]**—Arch. exp. VetMed. **14,** 528-556. 3224

Frogs inoculated by various routes did not develop lesions within 11 days. Virus was recovered from blood and skin but not from muscle, but there was no evidence of multiplication or increase in virulence of the virus. Frogs were of no epidemiological importance in F. & M. disease.—R.M.

Castagnoli, B., D'Amore, A., Fontanelli, E., Mazzaracchio, V., Orfei, Z., Ravaioli, L. & Zavagli, V. (1959). Risultati conclusivi della nuova vaccinazione anti-aftosa con virus su colture di cellule renali. **[Results of vaccination with foot and mouth disease virus grown on kidney cell culture.]**—Atti Soc. ital. Sci. vet. **13,** 582-585. [Summaries in English and French.] 3225

The vaccine described previously [*V.B.* **29,** 3809] protected cattle for 13 months, but not 14 months.—R.M.

Fellowes, O. N. (1960). **Chemical inactivation of foot-and-mouth disease virus.**—Ann. N.Y. Acad. Sci. **83,** 595-608. [Author's summary modified.] 3226

It can be concluded that it is now possible to manipulate the chemical environment of F. & M. virus so as to induce minimal changes or to destroy the virus completely. Such studies have been improved through more refined methods of cultivating the virus and detecting the virus or its attributes.

The research challenge for the future lies in the answers to the three questions: How does inactivation occur? Where does it occur in the virus structure? Is the same mechanism utilized by each inactivant?

Csontos, J. & Romváry, J. (1960). A komplementumkötési proba értéke a sertés Aujeszky-féle betegsége kórjelzésében. **[Diagnosis of Aujeszky's disease in pigs by the complement-fixation test.]** — Mag. állator. Lapja **15,** 121-123. [In Hungarian. Summaries in English and Russian.] 3227

As the diagnosis of Aujeszky's disease by rabbit inoculation was considered unreliable, the authors studied the use of the c.f. test. Sera of naturally and artificially infected pigs were used with antigens prepared from Aujeszky's virus propagated in porcine kidney tissue culture. The anticomplementary factors of pig sera were inactivated by keeping at pH 4–4·5 and refrigerating the material overnight.

Complement-fixing agents appeared in the sera of infected pigs in a week following infection, reached their peak at about the 5th week and disappeared within a further 3–4 weeks. Sera of non-infected or not recently infected pigs yielded negative results in all cases. Infected chorion allantois of chick embryos and suspensions of the brain of infected and non-infected pigs and rabbits, in water, alcohol, ether and inactivated g.pig serum, were also used as antigens in c.f. tests on the same sera, but all proved unreliable and the results were confusing.

The authors consider that positive complement-fixation tests carried out as described may be regarded as diagnostic of a recent infection with Aujeszky's disease of a herd, and their reliability is superior to the rabbit inoculation test.—A. Sebesteny.

Popovici, I., Wynohradnyk, V., Berbinschi, C., Feteanu, A. & Schuler, G. (1960). O epizootie gravă de boala lui Aujeszky la porcine adulte şi purcei asociată cu influenţa. **[A severe outbreak of Aujeszky's disease associated with influenza virus in pigs.]** — Probl. Epiz. vet., Bucureşti No. 9 37-45. [In Roumanian. Summaries in French and Russian.] 3228

Both viruses were isolated from an acute contagious disease of adult and young pigs in a large piggery. 218 sows aborted during the outbreak. The influenza virus was serologically related to the human A_2 type.—R.M.

Cîrstet, I., Coman, I. & Nistor, C. (1960). Incercări de preparare a serului contra bolii lui Aujeszky cu virus cultivat in vitro. **[Tissue culture virus as antigen for producing immune serum against Aujeszky's disease.]** — Probl. Epiz. vet., Bucureşti No. 9 pp. 46-55. [In Roumanian. Summaries in French and Russian.] 3229

Horses and pigs hyperimmunized by i/v inj. of tissue culture virus developed much higher titres of neutralizing antibody than

horses hyperimmunized by the conventional s/c injections of liver suspension from infected animals.—R.M.

Avery, R. J. & Tailyour, J. M. (1960). **The isolation of the rabies virus from insectivorous bats in British Columbia.**—Canad. J. comp. Med. **24,** 143-146. [Authors' summary modified.] 3230

Details of the isolation of rabies virus from four insectivorous bats in British Columbia and case histories are given. This is the first confirmation of bat rabies in Canada.

Identification of the agent was confirmed by passage into experimental animals and by specific anti-rabies serum-neutralization tests. Attempts to demonstrate the presence of rabies antibodies in normal bats captured in the same regions were negative.

Jennings, W. L., Schneider, N. J., Lewis, A. L. & Scatterday, J. E. (1960). **Fox rabies in Florida.**—J. Wildlife Mgmt **24,** 171-179. [Authors' summary modified.] 3231

One third of the rabid animals examined in the 10 years ending in 1958 were gray foxes. Areas with small fox populations served as barriers to the spread of rabies, as did major streams. Spread was fastest during the autumn dispersal and the winter mating season. Local outbreaks usually died out in summer. Fox populations which had been moderately reduced by trapping or by disease did not impede spread, although fewer attacks were reported from areas where reductions had occurred. The only observed effective control of fox rabies resulted from a concurrent infection of rabies and an undetermined disease recognized clinically as "fox encephalitis".

McMillan, B. & Boulger, L. R. (1960). **The susceptibility of the ground-squirrel Xerus (Euxerus) erythropus Geoffroy, 1803, to rabies street virus and its potentiality as a reservoir of rabies in Northern Nigeria.**—Ann. trop. Med. Parasit. **54,** 165-171. [Authors' summary modified.] 3232

It is a popular belief in parts of Northern Nigeria that a fatal madness follows the bite of the ground-squirrel in 1–6 months.

X. erythropus was susceptible to syringe-passage rabies street virus.

By questionnaire it was found that the ground-squirrel is very common and is widely hunted for food with the aid of dogs. It is suggested that the hunters' dogs may infect the ground-squirrel, and that transmission of the infection from this source to man has taken place in the past.

Because of a general fear of the bite of the ground-squirrel, its danger to man is now more potential than actual, but the animal must be considered if a rodent host of rabies in West Africa is postulated.

Huygelen, C. (1960). **Antirabic immunity in guinea-pigs induced by high egg passage Flury virus. The influence of the route of administration on the resistance to cerebral and extraneural challenge.**—J. Hyg., Camb. **58,** 187-191. [Author's summary modified.] 3233

Intracerebral inoculation of the vaccine protects against subsequent intracerebral or peripheral challenge with fixed virus. Intramuscular administration results in the development of good immunity to peripheral challenge. Intramuscular or intravenous inoculation of the vaccine fails to protect against intracerebral challenge.

Kasza, L., Bohl, E. H. & Jones, D. O. (1960). **Isolation and cultivation of swine pox virus in primary cell cultures of swine origin.**—Amer. J. vet. Res. **21,** 269-273. 3234

Swine pox virus was isolated in monolayer cultures of pig kidney cells from the pock lesions and lice of affected pigs. Cytopathogenicity, characterized by intranuclear vacuoles, cytoplasmic inclusion bodies and destruction of most of the cells, was observed in the fourth blind passage and in subsequent passages. Typical pocks formed on pigs inoculated with virus of the sixth passage. The virus did not cause lesions in the chorioallantoic membrane of chick embryos, the scarified skin of rabbits and g.pigs, nor kidney cells from cattle and rabbits. Serum from hyperimmunized pigs and rabbits did not neutralize the virus *in vitro,* but pigs that had recovered from infection with the culture virus resisted re-infection with culture virus. —M.G.G.

Sauer, R. M., Prier, J. E., Buchanan, R. S., Creamer, A. A. & Fegley, H. C. (1960). **Studies on a pox disease of monkeys. I. Pathology.**—Amer. J. vet. Res. **21,** 377-380. 3235

Prier, J. E., Sauer, R. M., Malsberger, R. G. & Sillaman, J. M. (1960). **Studies on a pox disease of monkeys. II. Isolation of the etiologic agent.**—Ibid. 381-384. [Authors' summaries modified.] 3236

I. A pox disease was observed in a large colony of *Macaca philippinensis, M. mulatta,* and *Cercopithecus aethiops* var. *sabaeus.* The gross and microscopic pathology of tissues from naturally affected animals is described. The most significant feature was the presence of intranuclear and intracytoplasmic epidermal inclusion bodies. The relationship to other pox diseases is discussed.

II. A viral agent was isolated from a pox-like disease in monkeys; it was propagated in tissue culture and on the chorioallantoic membranes of chick embryos. Although the haemagglutinin of this virus could not be distinguished from that of vaccinia, the lesions produced on the chorioallantoic membrane of chick embryos by the two viruses differed. Complement-fixation tests indicate an antigenic difference between the new agent and vaccinia virus. Results to date suggest that this agent is a new and distinct member of the variola-vaccinia group of viruses, but the exact relationship to the other members of the group has not been established.

Bamberger, K. & Beke, L. (1960). Nátha tüneteiben jelentkező baromfihimlő kórjelzése. **[Diagnosis of fowl pox clinically resembling coryza.]**—Mag. állator. Lapja **15,** 173-175. [In Hungarian. Summaries in English and Russian.] **3237**

An outbreak of fowl pox manifested solely by respiratory symptoms—particularly coryza—is described. The management of the flock, the routine control measures employed against the common diseases, the symptoms and epidemiology of the outbreak, are described in detail. Diagnosis was made by eliminating the 14 other recognized respiratory diseases and by producing typical pox lesions on the skin of 2 fowls by rubbing emulsified tracheal mucous membrane of affected birds into their feather follicles. Vaccination of 2,500 breeding fowls and 3,400 chickens (2–4 months old) with turkey pox virus by the wing-web method decreased the severity of symptoms, increased production in the flock, and improved the average condition, within 2 weeks.—A. Sebesteny.

Hartwigk, H. & Bengelsdorff, H.-J. (1960). Auswertversuche an Taubenpocken-Virus-Impfstoffen. **[Evaluation of pigeon pox virus vaccines.]** — Tierärztl. Umsch. **15,** 122-125. **3238**

Intrafollicular inoculation of fowls with increasing dilutions of two pigeon pox virus vaccines revealed that the ability to form pocks declined less in the one that had been obtained from pigeons than in the one that had been obtained from chick embryos.

—M.G.G.

Rice, C. E. (1960). **The use of the complement-fixation test in the study and diagnosis of viral diseases in man and animals—a review. II. The pox viruses.**—Canad. J. comp. Med. **24,** 154-157. [Author's summary modified.] **3239**

The c.f. test has provided considerable information on the antigenic composition of vaccinia-variola viruses. The test has also been applied in the demonstration of viral antigen in pus from cases of smallpox and in the detection of antibody in the sera of survivors and in sera of vaccinated individuals. Smallpox has become a rare disease in most countries which increases the need for a test to distinguish between milder forms of smallpox and chicken pox.

Except in cow pox and in ectromelia of mice, the complement-fixation test has received little attention in the study of pox diseases in animals or birds.

Bauer, D. J. & Sadler, P. W. (1960). **New antiviral chemotherapeutic agent active against smallpox infection.**—Lancet, May 21st, 1110-1111. [Authors' summary.] **3240**

Infant mice infected intracerebrally with 100 $L.D._{50}$ of alastrim virus could be protected against death and the development of encephalitis by treatment with N-ethylisatin β-thiosemicarbazone at a dose level of 5 mg. per kg. The compound has a low toxicity and the therapeutic index is greater than 2000. The antiviral chemotherapeutic activity found in animal experiments is thus high enough to suggest that N-ethylisatin β-thiosemicarbazone may be of value in the specific treatment of smallpox in man.

Isaacs, A. & Hitchcock, G. (1960). **Role of interferon in recovery from virus infections.** —Lancet, July 9th, 69-71. [Authors' summary modified.] **3241**

Mice were infected intranasally with different doses of influenza virus and their lungs and sera were studied for virus content, viral antibody, and interferon. The interferon content of the lungs followed closely the peak of virus titre, but antibody was not detected in the lungs and sera until at least a week later. It is concluded that interferon may play a significant role in the recovery of mice from influenza-virus infection.

Ilyenko, V. I. & Pokrovskaya, O. A. (1960). **Characteristics of the course of experimental infection in monkeys inoculated with tick-borne and bi-phasic encephalitis and louping ill viruses.**—Acta virologica, Prague **4**, 75-81. [In English. Authors' summary modified.] 3242

The clinical course of disease in monkeys infected with tick-borne encephalitis, bi-phasic encephalitis or louping-ill viruses can be used to differentiate between the causative agents of these infections. The viruses were injected into the brain or into the spinal chord. Tick-borne encephalitis was characterized by flaccid paralysis of the limbs; louping-ill by disorders of a cerebellar character, ocular paresis and nystagmus; bi-phasic meningoencephalitis by involvement of the cerebellum with simultaneous development of paralysis of a spinal and cerebral character.

Gaĭdomovich, S. Y. & Obukhova, V. R. (1960). **[Susceptibility of kidney epithelium cultures from sheep embryos to the viruses of Japanese and tick-borne encephalitis.]** — Voprosy Virusologii **5**, 304-309. [In Russian. Summary in English.] 3243

Japanese encephalitis virus maintained in mice caused severe degeneration of sheep kidney cells 2–3 days after inoculation. Through 14 passages with tick-borne encephalitis a cytopathic action was seen only during the first passage. The viruses of Eastern, Western and Venezuelan equine encephalomyelitis showed a cytopathic action 24 hours after inoculation.—R.M.

Calnek, B. W. & Taylor, P. J. (1960). **Studies on avian encephalomyelitis. III. Immune response to beta-propiolactone inactivated virus.**—Avian Diseases **4**, 115-122. [Authors' summary modified.] 3244

The inactivated virus was given intramuscularly. Consistently high responses were obtained to two doses (with a 5-week interval) of 200,000 to 400,000 EID_{50}, and neutralization indices were generally between 2 and 3.

Lockart, R. A., Jr. (1960). **The production and maintenance of a virus carrier state: the possible role of homologous interference.** — Virology **10**, 198-210. [Author's summary modified.] 3245

It has been shown that L cells, exposed to large amounts of heat-inactivated WEE virus, become refractory to destruction by active WEE virus and such cells neither yield virus nor do they show cytopathic effects. Cells which have been made resistant by exposure to inactive virus still adsorb active virus in a normal fashion (see reservation above). The resistance to infection conferred on the cells by exposure to inactive virus preparations is retained through several cell divisions in the absence of any further additions of virus. Cultures of cells which have been rendered resistant to infection by treatment with inactive virus may readily become persistently infected with active WEE, and the persistence of this chronically infected state may be due to the continued operation of the interference mechanism.

Shishkina, K. A. (1959). **[Cultivation of the virus of equine encephalomyelitis in embryonated eggs of fowls, ducks and pigeons.]**— Trudy Kazan. nauchno-issled. vet. Inst. **13**, 196-230. [In Russian.] 3246

The properties of four strains of virus were compared.—R.M.

Tabuchi, E., Katada, M. & Watase, H. (1960). **[Haematological changes in visceral blood of horses infected with infectious anaemia.]** — Bull. Nat. Inst. Anim. Hlth. Tokyo No. 38 pp. 47-73. [In Japanese. Summary in English.] 3247

Visceral blood was obtained from the splenic, portal and hepatic veins of 13 freshly-killed infected horses. There was evidence that iron was transferred from spleen to liver by iron granules released from destroyed siderocytes as well as by intact siderocytes. Extensive destruction of siderocytes appeared to be specific for infectious anaemia.—R.M.

Kawakami, Y., Kaji, T., Sugimura, K., Ishitani, R., Shimizu, T. & Matumoto, M. (1959). **Histopathological study of aborted fetuses naturally infected with equine abortion virus, with some epidemiological findings.**—Jap. J. exp. Med. **29**, 635-641. [In English. Authors' summary modified.] 3248

In view of the high incidence of complement-fixing antibodies for equine abortion virus among horses, 37 foetuses free from bacterial infections were collected in Hokkaido and examined histologically. In 3 foetuses histological changes suggesting this virus infection were demonstrated. The most conspicuous lesions were in the liver and spleen which showed marked hyperaemia, haemorrhage and oedema. Conspicuous multiple necrosis in the liver and follicular necrosis in the spleen were found. Eosinophilic inclusion bodies were demonstrated in

the nuclei of liver cells. Other cells in the liver and spleen occasionally contained the inclusion body. A serological survey was conducted on the general equine population by complement fixation test. After due consideration of various factors the conclusion seemed justified that this virus infection may be endemic in Hokkaido.

I. Mornet, P. & Gilbert, Y. (1960). Bases et moyens du diagnostic de la peste bovine. **[The diagnosis of rinderpest.]** — Bull. Off. int. Epiz. **53**, 13-37. [Summaries in English and Spanish.] 3249

II. Dhanda, M. R. (1960). **Existing sanitary situation regarding rinderpest in India.** — Ibid. 92-95. [In English. In French pp. 96-99.] 3250

III. Anon. (1960). **Rinderpest in Pakistan.**— Ibid. 109-110. [In English. In French pp. 110-111.] 3251

IV. Rafyi, A., Kaweh, M. & Ramyar, H. (1960). **The eradication of rinderpest in Iran by formolized vaccine. Use of attenuated virus and attempt at attenuation of a local strain of virus.**—Ibid. 139-145. [In English. In French pp. 146-152.] 3252

I. A general account of the epidemiology, symptomatology and pathology of rinderpest and its differential and experimental diagnosis.

II. The rinderpest situation is reviewed. Progress was made in the control of the disease by the introduction by J. T. Edwards of goat virus vaccine. A pilot scheme for the vaccination of all cattle (except those under 6 months and those in advanced pregnancy) was put into operation in 1954 in the southern states. Vaccine was produced at Izatnagar. The plan was subsequently extended to all the States and more production units were set up for freeze-dried goat tissue and lapinized vaccines; the latter, it is hoped, will soon be replaced by avianized which is easier and cheaper to produce and does not cause systemic reaction in the more susceptible cattle. The campaign has been in progress for 5 years and 60 million of 131 million cattle have been vaccinated, 60–80% protection being achieved. The States of Kerala, Madras and Mysore are reported free from infection. Early completion of the campaign is anticipated. Quarantine posts are being established along the land frontiers.

III. The disease in Pakistan is endemic but assumes epidemic proportions at intervals of 5–10 years. Control is by vaccination with goat tissue vaccine, alone or in combination with serum. Trials are being carried out with lapinized vaccine. The formation of a Central Rinderpest Committee is under consideration.

IV. Rinderpest last occurred in Iran in 1949 and the country's freedom since that date is attributed to vaccination, with a formolized vaccine containing saponin (a modification of the vaccine described by Curasson & Delpy). The vaccine is cheap to produce and confers immunity lasting 2 years. In 30 test cattle goat virus vaccine engendered an immunity lasting 30 months. An Iranian strain of virus retained its virulence for calves during 262 passages in goats; some attenuation was observed after 572 passages in rabbits, but this was not enough to justify its use as a vaccine.—T.E.G.R.

Libeau, J. & Scott, G. R. (1960). Etat actuel de la peste bovine en Afrique orientale. **[Rinderpest in East Africa to-day.]** — Bull. Off. int. Epiz. **53**, 80-85. [In English. pp. 86-91.] 3253

Rinderpest has been eradicated from East Africa except the southern Sudan, Ethiopia and adjacent parts of Uganda, Kenya and Somalia. It is endemic in wild game in the Kenya and Tanganyika Masailand, where sporadic outbreaks occur in uninoculated calves. Vaccination is compulsory and free in Ethiopia, in a barrier zone across northern Tanganyika and northern Uganda, and in cattle owned by Africans in Kenya. Both caprinized and lapinized viruses are used. Infected animals are not slaughtered, but quarantine measures are applied to infected herds in all East Africa except Ethiopia. In Somalia, Kenya, Uganda and Tanganyika cattle are inoculated before being moved for slaughter in uninfected areas; no incident has been reported in such cattle.—M.G.G.

White, G. & Scott, G. R. (1960). **An indirect gel diffusion precipitation test for the detection of rinderpest antibody in convalescent cattle.**—Res. vet. Sci. **1**, 226-229. [Authors' summary modified.] 3254

Antibodies in the sera of convalescent cattle were readily detected by an indirect gel test. Such antibodies were not present in the sera of rinderpest-susceptible cattle. The antibodies differed from neutralizing antibodies and an apparent correlation existed between the development of antibody and the severity of the clinical reaction.

Nystedt, H. (1960). Ume-sjukan. En smittsam, virusbetingad slemhinneinfektion hos nötkreatur i Västerbotten. **[Ume-disease, a**

mucosal infection of cattle in Västerbotten, caused by para-influenza 3 virus.] — Medlemsbl. Sverig. VetFörb. **12**, 129-132 & 135. [In Swedish.] 3255

The disease (named after the town of Umea in Sweden, where it is endemic) causes serious losses from death, emergency slaughter, drop in milk production, etc. Two clinical forms, enteritis and rhino-tracheitis, are recognizable. Cows in late pregnancy or recently calved are the most susceptible and most outbreaks occur between November and February. Calves are susceptible particularly to the respiratory form and may have severe but transitory symptoms. Observations on the epidemiology suggest that the disease agent may lie latent in the digestive or respiratory tract until stress on the host (change of food or environment, long journeys, pregnancy or recent calving) allows it to increase its virulence and cause disease, not necessarily in the carrier but in the herd to which it is introduced, the first manifestation being a sudden drop in milk yield in that herd. The State Institute of Veterinary Medicine made virological and pathological investigations of a severe outbreak in Sept. 1958 and Bakos & Dinter [*V.B.* **30**, 1819] have reported the isolation of a virus identified as para-influenza 3. N. considered it of interest that from Umea and from other districts in the county, cases of an infectious influenza-like disease have been reported in dogs, often on farms where cattle had Ume-disease or members of the household had influenza: distemper was excluded. Though serological tests on these dogs were negative for para-influenza 3 virus, it seemed likely that an influenza virus was involved.—F.E.W.

Ayre-Smith, R. A. (1960). **The symptoms and clinical diagnosis of lumpy skin disease.** — Vet. Rec. **72**, 469-471 & 472. [Author's summary modified.] 3256

In Kenya lumpy skin disease was first diagnosed in December 1957; it was mild and of low morbidity and mortality.

The symptoms did not appear to be related to age, breed, colour or sex of the cattle affected. The typical lesion was a small intradermal "nodule," which was circular and flat topped. Lesions of the respiratory and alimentary tracts were frequently observed.

Clinical diagnosis was based mainly on the appearance of intradermal nodules. Differential diagnosis is discussed.

Butler, E. J. & Smith, W. (1960). **An attempt to separate the scrapie agent from brain tissue.**—Vet. Rec. **72**, 417-418. 3257

The scrapie agent was not inactivated by extraction of infected brain with ether at 32° to 36° C. for 10½ hours and with water at 94° to 98° C. for 24 hours, since the disease developed in up to a third of the sheep inoculated intracerebrally with the extracts or residues.—M.G.G.

Hughes, R. W. & Gustafson, D. P. (1960). **Some factors that may influence hog cholera transmission.**—Amer. J. vet. Res. **21**, 464-471. [Authors' summary modified.] 3258

When varying concentrations of swine fever virus were given to pigs by mouth, the incidence of infection was relatively low; only two of ten trials were successful. When similar amounts of virus were mixed with an innocuous amount of *Salmonella choleraesuis* and given by mouth swine fever ensued in all ten trials.

The virus plus salmonella, when placed on the unbroken skin of pigs, caused swine fever in all 3 pigs exposed, while only 1 of 3 pigs developed swine fever when exposed to the virus without salmonella.

All pigs exposed to the virus by way of the conjunctival sac or the abraded skin developed the disease with or without the presence of *S. choleraesuis*.

Transmission was successful in six of nine aerosol trials in which susceptible pigs were exposed to the exhaust air from isolation cans containing swine fever-infected pigs.

English sparrows, when allowed to fly from swine fever-affected pigs to susceptible pigs, transmitted the disease in 2 of 3 trials. Pigs housed only 3 ft. away from the affected pigs, but which had no contact with the sparrows, remained healthy.

Attempts to transmit swine fever using earthworms, stable flies, and houseflies were unsuccessful.

Collins, K. E. (1960). **Enhancement of infectivity of hog cholera virus.** — Amer. J. vet. Res. **21**, 472-474. [Author's summary modified.] 3259

Swine fever virus in blood serum, diluted or undiluted, was exposed to different conditions of pH, temperature and trypsin content, and the treated preparations titrated in susceptible pigs. No significant increases in infectivity titre were found for the diluted preparations. Large (ten thousand-fold) increases in the measured $I.D._{50}$ per ml. were

found for undiluted preparations treated at pH 8·5 and 40°C. in the presence of 0·5% trypsin or at pH 5·5 and 25°C. in the absence of trypsin. In the latter case, the infectivity titre was reversibly dependent on pH.

Collins, K. E. (1960). **The passage of hog cholera virus through cellulose dialysis membranes.** — Amer. J. vet. Res. **21,** 475-477. [Author's summary modified.] **3260**

Swine fever virus in blood serum was dialysed against normal pig serum and against phosphate buffer solutions, using cellulose dialysis membranes. The virus passed through the membranes into normal pig serum at pH 8·5 and into phosphate buffer solution at pH 5·5.

Goret, P., Lephteriotis, E., Mackowiak, C. & Girard, M. (1960). Recherches sur la technique de séro-vaccination dans la peste porcine, en milieu sain, à l'aide du virus lapinisé. **[Technique for immunizing pigs against swine fever with lapinized virus and immune serum.]**—Rec. Méd. vét. **136,** 339-361. [Summaries in English and Spanish.] **3261**

Weybridge strain SFA (Hudson) was used with immune serum in pigs weighing 25–30 kg. Four methods were tested: (1) virus i/m, serum s/c; (2) virus s/c, serum i/m; (3) simultaneous i/m injection (a) into two opposite sites in the body (b) into a single site; (4) i/m inj. of mixed virus/serum. Only method 3(a) gave firm immunity without side-reactions. Of 400 pigs vaccinated in the field by this method five had mild general reactions, without fever, and slight anorexia. Six of these pigs challenged 6–7 months later resisted a dose of virulent virus which killed the controls. The method is recommended, but only for use in a healthy environment and using a relatively small dose of serum. In infected environments where large doses of serum are needed it is preferable at present to use the classical method.—F.E.W.

Holbrook, A. A., Geleta, J. N. & Hopkins, S. R. (1960). **Two new immunological types of vesicular exanthema virus.** — Proc. 63rd Meet. U.S. Livestock Sanit. Ass. San Francisco, 1959. pp. 332-339. [Authors' summary modified.] **3262**

Two new immunological types of vesicular exanthema virus isolated in New Jersey were identified as J56 and K54.

Type J56 had low pathogenicity for pigs and was difficult to adapt to tissue culture cells, whereas K54 was highly pathogenic for pigs and easily adapted to tissue culture cells.

Previously isolated types, labelled A to K, were confirmed as immunological types by cross neutralization studies in tissue culture and cross immunity studies in pigs.

Horses were inoculated with each type of virus. Only those horses inoculated with type D53 developed vesicles. In a horse inoculated with type A48, necrosis was observed along the lines of inoculation. All horses inoculated with the remaining types were negative.

Cows, adult fowls, and g.pigs were negative when exposed to all 11 virus types.

Sasahara, J., Kato, K. & Watanabe, M. (1960). **[Studies on immune serum of para-influenza 1 (HVJ) virus.]** — Bull. Nat. Inst. Anim. Hlth, Tokyo No. 38 pp. 1-9. [In Japanese. English summary modified.] **3263**

Hyperimmune serums were prepared from pigs inoculated intravenously with chorioallantoic fluid containing para-influenza 1 virus (or HVJ, Haemagglutinating Virus of Japan). The haemagglutination-inhibition and neutralizing antibody titres of the antiserums were determined and potency tests were carried out on mice and pigs. The favourable effect of treatment with the antiserum is observed in the survival rate of and infectivity for mice, and the degree of fever, clinical symptoms, and body weight in pigs after challenge.

Steen-Knudsen, B. (1960). Behandling af hard pad disease med Globulon. **[Treatment of "hard pad" disease with gamma globulin.]** —Medlemsbl. danske Dyrlaegeforen. **43,** 150-155. [In Danish.] **3264**

Of 15 cases in Copenhagen treated with "Globulon" (marketed in the U.S.A. and stated to contain antibodies against distemper, canine virus hepatitis and leptospirosis) 11 were cured and 4 died or were killed when moribund. Those which failed to respond had been ill for upwards of one month when treated. Most cases were given 20 ml. of "Globulon"; about half of them also received chloramphenicol and were given a second dose of "Globulon" after an interval of 2–5 days. —F.E.W.

Millian, S., Maisel, J., Kempe, C. H., Plotkin, S., Pagano, J. & Warren, J. (1960). **Antibody response of man to canine distemper virus.**—J. Bact. **79,** 616-618. **3265**

Inoculation of children with 1–3 doses of

either a live egg-adapted or a formalin inactivated canine distemper virus vaccine produced no clinical reactions and induced variable levels of canine distemper virus neutralizing antibody but no measles complement-fixing antibody. Inoculation with an attenuated measles virus vaccine stimulated not only measles c.f. antibodies but also some increase in distemper neutralizing antibodies.—A. ACKROYD.

Simonella, P. & Di Blasio, A. (1959). Il quadro sieroproteico nell'epatite infettiva sperimentale del cane. [**Serum proteins in canine virus hepatitis.**] — Atti Soc. ital. Sci. vet. **13,** 733-739. [Summaries in English and French.] 3266

Tests on 8 experimentally-infected puppies confirmed the findings of Freudiger (1957), Larin [*V.B.* **29,** 3163] and others.—R.M.

Leader, R. W., Pomerat, C. M. & Lefeber, C. G. (1960). **Intranuclear "crystals" in dog kidney cells infected with canine hepatitis virus.**—Virology **10,** 268-270. 3267

Studies by electron microscopy were made of the nuclear changes in cultured canine kidney cells infected with closely related strains of the virus of infectious canine hepatitis. Crystal-like structures, but not inclusion bodies, were observed in the nuclei of some infected cells. These structures were produced by only 2 of the 6 strains used and their formation was prevented by the use of specific immune serum in dilutions which neutralized the virus; they did not occur in uninfected cells. The crystals, which are described, were different from those observed (by other workers) in HeLa cells infected with adenovirus and closely resembled those in tobacco plants infected with severe etch virus. Crystal formation within infected cells is discussed.—T.E.G.R.

Crandell, R. A., Ganaway, J. R., Niemann, W. H. & Maurer, F. D. (1960). **Comparative study of three isolates with the original feline viral rhinotracheitis virus.** — Amer. J. vet. Res. **21,** 504-506. 3268

The authors isolated in 1957 an apparently new virus from a small number of kittens with conjunctivitis, lacrimation, nasal discharge, coughing and sneezing [*V.B.* **28,** 2865]. The virus differed from that of feline pneumonitis and it was associated with intranuclear inclusion bodies; the name 'feline rhinotracheitis virus' was applied to it. Subsequently 3 other strains were isolated from cats in Washington, Maryland and Pennsylvania and their action on tissue cultures of feline kidney cells was compared. The four strains showed similar cytopathic action and each was neutralized by immune serum prepared against the other strains.—R.M.

Knox, B. (1960). Udbrud af virus enteritis hos mink i Danmark. [**Virus enteritis of mink in Denmark.**]—Nord. VetMed. **12,** 145-169. [In Danish. Summaries in English, French and German.] 3269

Since the initial outbreaks in 1958 [*V.B.* **29,** 1423], 14 further outbreaks have occurred in Denmark; 13 were in June, and mainly in unweaned kits (5–6 weeks old) in which the illness was peracute (course 12–24 hours) with practically 100% mortality. In kits older than 7 weeks the course was usually 1–3 days. Diagnosis is discussed, since in the younger kits the clinical picture, P.M. findings and histology of the lesions differed from the findings described as characteristic from North America. Six of the 11 farms had had contact with affected farms; in the other 5 the source of infection could not be traced. As the virus had been found (by Crawley in Toronto) immunologically identical with the Canadian virus, the Connaught formolized mink enteritis vaccine from Toronto was used prophylactically. Between mid-June and mid-July about half a million mink received the vaccine. No outbreaks were reported on any of the vaccinated farms, and on affected farms the vaccine had a pronounced effect after 8–10 days. This appears to be the first record of virus enteritis in mink as young as 5–6 weeks. —F.E.W.

Ferris, D. H., Lord, R. D., Jr., Beamer, P. D. & Fritz, T. E. (1960). **A new disease in Illinois cottontails.** — J. Wildlife Mgmt **24,** 179-184. [Authors' summary modified.] 3270

The appearance of unusual nervous signs in 24 sick rabbits of a colony of 94 cottontail rabbits stimulated investigation of this disease. Successful laboratory passage plus lack of evidence of any bacterial, mycotic or toxic cause indicates that the agent is a virus. Histology of the lesions in nervous tissue from the sick rabbits also indicated a virus infection.

Anderson, C. R., Spence, L. P., Downs, W. G. & Aitken, T. H. G. (1960). **Manzanilla virus: a new virus isolated from the blood of a howler monkey in Trinidad, W.I.**—Amer. J. trop. Med. Hyg. **9,** 78-80. 3271

68 sera from monkeys shot during a

yellow-fever investigation were inoculated into baby mice. Yellow fever virus was not isolated, but an apparently new virus was isolated from one monkey. No antibodies to the virus were detected in 47 human sera. —R.M.

Karzon, D. T. & Bussell, R. H. (1960). **Studies of the nonspecific inactivation of Newcastle disease virus by mammalian sera.** — Ann. N.Y. Acad. Sci. **83**, 539-550. 3272

Schaffer, F. L. (1960). **Interaction of highly purified poliovirus with formaldehyde.**—Ibid. 564-577. 3273

LoGrippo, G. A. (1960). **Investigations of the use of beta-propiolactone in virus inactivation.**—Ibid. 578-594. 3274

Salk, J. E. & Gori, J. B. (1960). **A review of theoretical, experimental and practical considerations in the use of formaldehyde for the inactivation of poliovirus.** — Ibid. 609-637. 3275

Gard, S. (1960). **Theoretical considerations in the inactivation of viruses by chemical means.** —Ibid. 638-648. 3276

Pollard, E. C. (1960). **Theory of the physical means of the inactivation of viruses.** — Ibid. 654-660. 3277

Taylor, A. R. (1960). **Effects of nonionizing radiations on animal viruses.**—Ibid. 670-683. 3278

These are some of the 19 papers read at a conference on the inactivation of viruses held by the New York Academy of Science in March 1959, and published as Article 4 of volume 83 of the Annals of the academy. They will interest all who deal with virology, vaccine production and disinfection. Two papers on inactivation of foot and mouth disease virus by O. N. Fellowes and G. T. Dimopoullos will be abstracted separately. —R.M.

Sinkovics, J. (1960). **Interactions of the Newcastle disease virus with mouse tissues. I. Enhancement of the neurotoxicity of the virus and preliminary experiments with toxic brain extracts.** — Arch. ges. Virusforsch. **10**, 103-125. [In English.] 3279

Adaptation of 3 strains of Newcastle disease virus (California 11914, R.O., and Victoria) to the brain of unweaned mice (SMB line) failed to result in the development of any new genetic markers such as ability to grow in adult mouse brain or inability to grow in the allantoic cavity of chick embryo. The SMB line R.O. strain was more neurotoxic for adult mice than the allantoic line even though, unlike the allantoic line, no evidence of replication of infective particles was found in the brains of adult mice and no mature particles could be seen under the electron microscope. Immunization of adult mice with toxic brain extracts, although it resulted in the development of low haemagglutination inhibiting antibody titres, did not protect against the neurotoxic effects of SMB virus; the antibodies were inactive in virus neutralization tests.—A. Ackroyd.

Monda, V. & De Bonis, G. (1959). Ulteriori ricerche sulla durata della vitalità del virus di Newcastle (ceppo "F" di Asplin) conservato a diverse temperature. [**Survival of Newcastle disease virus at different temperatures.**]—Atti Soc. ital. Sci. vet. **13**, 745-749. [Summaries in French and German.] 3280

When Strain F in amnio-allantoic fluid was kept at 37°C. it retained its immunizing capacity for 35 days, as judged by resistance to challenge 15 days after inoculation of 2 drops of the Strain F preparation into nose and eye, but lost it at 45 days. The virus was completely inactivated after 135 days.—R.M.

Balla, L. (1960). Kísérletek a folyékony H-vakcina eltarthatóságának fokozására. II. Egyes termelési tényezők hatása a baromfipestis elleni folyékony élővírus-vakcinák eltarthatóságára. [**Improving the keeping quality of live Newcastle disease vaccine. II. Production factors.**]—Mag. állator. Lapja **15**, 125-128. [In Hungarian. Summaries in English and Russian.] 3281

The keeping quality of fluid H vaccine was studied. High initial virus titre and storage at low temperature (—35° to —40°C.) favoured the maintenance of virulence; variations in storage temp. and addition of high concentrations of antibiotics did not affect keeping quality; while storage at higher temp. (—5° to —12°C.) and addition of 0·04% thiomersal caused considerable loss of virulence within 4 months. Addition of 0·0025% of thiomersal was adequate for control of fungal contamination, and did not affect keeping quality.—A. Sebesteny.

Cunningham, C. H. (1960). **Recent studies on the virus of infectious bronchitis.**—Amer. J. vet. Res. **21**, 498-503. [Author's summary modified.] 3282

The Beaudette strain of infectious bronchitis virus (IBV) was readily passaged in cultures of chick embryo kidney cells and in the isolated chorioallantoic membrane (c.a.m.).

No specific cytological changes attributable to viral activity were observed in the c.a.m. The virus can be titrated with chick embryo kidney cultures by using cytopathic effects as revealed by microscopic examination and by the plaque technique.

The omission of ions and glucose from Hanks' balanced salt solution deleteriously affects, but does not completely inhibit, viral synthesis in the isolated c.a.m.

There are at least two antigenic and immunogenic types of virus (Connecticut and Massachusetts), and it is possible that additional types may be defined.

Trypsin-modified IBV in low egg passage contains a haemagglutinative agent.

Histological reactions of the trachea may be used to assay infection and neutralization by antibody.

Embryo-propagated IBV can be separated into original phase and derivative phase particles by differential thermostability. By means of the limiting dilution technique, original phase characteristics can be maintained through serial passage in eggs. Antigen-antibody complexes of IBV and antiserum may be detected by agar-diffusion analysis. None of the precipitating antigens can be specifically ascribed to IBV.

Other miscellaneous properties of IBV are reported.

Pette, J. (1960). Verhalten von Hühnerbronchitisvirusstämmen in der Gewebekultur und Eignung der Gewebekultur zum Nachweis virusneutralisierender Serumantikörper. **[Tissue culture of avian bronchitis virus and its use for detecting neutralizing antibodies in serum.]** — Zbl. VetMed. **7,** 483-497. [Summaries in English, French and Spanish.] 3283

Attempts were made to grow the American strains "Massachusetts" (M), "Beaudette" (B) and "Connecticut" (C) in chick fibroblast cultures by the method of Mayr & Kalcher [*V.B.* **30,** 2878] and using the nutrient fluid VM2a of Schwöbel & Traub [*V.B.* **30,** 394]. Only the avirulent Strain B could be adapted to the cultures. Neutralization tests with immune or convalescent sera were successful, but titres obtained for Strain C (of intermediate virulence) were always lower than the highly virulent M strain.

—R.M.

Atanasiu, P. & Lépine, P. (1960). Étude morphologique, en microscopie électronique sur coupes ultra-fines, d'un virus (virus GAL) présent dans la souche RPL_{12} du virus de la leucose aviaire. **[Electron microscopy of a virus (virus GAL) associated with the RPL 12 strain of fowl leucosis.]**—Ann. Inst. Pasteur **98,** 915-919. [English summary modified.] 3284

Lymphoid leucosis virus (strain RPL_{12}) is associated with a contaminant virus (GAL or "Gallus adeno-like") which propagates in the nucleus and cytoplasm of chick embryo liver cells in tissue culture.

In the nucleus, the virus particles of GAL virus may show a crystalline arrangement. In certain cells the virus propagates from the nucleus toward the periphery either through vesicles formed by the nuclear membrane, or by circulating in the small ducts of the endoplasmic reticulum.

Burmester, B. R. (1960). **Recent studies on the biological and physical characteristics of the avian leukosis viruses.**—Proc. 63rd Meet. U.S. Livestock Sanit. Ass. San Francisco, 1959. pp. 211-222. [Author's summary modified.] 3285

Recent research on the avian leucosis viruses including electron microscopy, tissue culture and aetiological interrelationships was reviewed. The specific virus particle of the various leucoses as well as other virus neoplasms are morphologically indistinguishable. It is about 80 mμ in diameter, has an electron dense core of 30–40 mμ and a distinct limiting membrane which often appears double.

In myeloblastosis, the virus particles arise in viroplasts, also known as "gray bodies"; the latter appear to be derived from mitochondria. Maturation and liberation of the particles are related to the cytoplasmic vesicles and vacuoles. Adenosine triphosphatase activity of the virus is acquired during synthesis in the viroplast and is related to this particular enzymic activity of the granules of the myelocyte which also are derived from mitochondria. A similar origin of virus particles in erythroblastosis and visceral lymphomatosis has been suggested, but distinct ATPase activity is not involved. The virus of myeloblastosis has been grown in myeloblasts of normal bone marrow and in the cells of chickens with myeloblastosis. Cultures have been maintained for periods of at least six months and at times each cell has produced 31 particles an hour.

A cytopathic virus has been obtained from strain RPL12 visceral lymphomatosis and from other sources of this disease. Early results indicated that the virus was identical,

or closely related to, the virus causing visceral lymphomatosis, but recent studies cast doubt on this.

Viruses which cause visceral lymphomatosis, without exception, also cause other neoplasms; thus it can be said that "pure" strains of visceral lymphomatosis have not yet been isolated. Erythroblastosis most commonly occurs as a second neoplasm in chickens inoculated with visceral lymphomatosis material. The proportion of the two leucoses occurring in any group of inoculated chicks is profoundly influenced by the dose of virus. Although there is strong circumstantial evidence that erythroblastosis and visceral lymphomatosis are caused by the same virus and that other neoplasms are caused by different viruses, there are still too many unanswered questions and unexplained experimental results to permit drawing any conclusions at the present time.

Burmester, B. R., Fontes, A. K., Waters, N. F., Bryan, W. R. & Groupé, V. (1960). **The response of several inbred lines of White Leghorns to inoculation with the viruses of strain RPL 12 visceral lymphomatosis-erythroblastosis and of Rous sarcoma.**—Poult. Sci. **39**, 199-215. **3286**

Six inbred lines were studied over several years, and susceptibility to experimental infection with either agent was tested in 12,000 chicks. One line (No. 7) was outstandingly resistant to both viruses. Two others resisted the leucosis virus but were very susceptible to Rous sarcoma.—R.M.

Derzsy, D. & Tóth Baranyi, I. (1960). A csirkék fertőző ízületgyulladása. **[Avian infectious synovitis.]**—Mag. állator. Lapja **15**, 177-181. [In Hungarian. Summaries in English and Russian.] **3287**

An outbreak of infectious synovitis was observed in a flock of 3,000 chicks (10–12 weeks old) mainly built up from stock imported from Denmark and Holland. The symptoms, epidemiology and the P.M. findings are described in detail. The disease was successfully transmitted by i/m and i/v injections of emulsions of spleen and liver and of synovial fluid of affected birds, but not by oral administration of these materials nor by contact. No bacteria or PPLO were isolated but infected tissue injected into the vitelline sac of 6-day-old chick embryos caused their death within 6–14 days with characteristic lesions, which are described. Addition of 5–10 mg. streptomycin, oxytetracycline and chlortetracycline to infected eggs inhibited the lethal action of the infecting agent in most cases and allowed successful hatching. An oxytetracycline preparation and a chlortetracycline preparation given in the food and also by injection resulted in a transient overall improvement, but many cases relapsed. However, 2–3 s/c injections at 7–10 day intervals cut losses amongst birds under 4–6 months of age to a minimum, above which age the susceptibility of the birds to the disease shows a marked decline. The authors discussed the field diagnosis and the economic importance of the disease.—A. Sebesteny.

Henneberg, G. (1960). Untersuchungen über Psittakose. **[Studies on psittacosis.]**—Zbl. Bakt. I. (Orig.) **179**, 29-38. [Summaries in English, French, Spanish and Russian.] **3288**

At the Robert Koch Institute in Berlin 3,078 birds were examined for psittacosis between January 1953 and June 1959 and the virus was detected by mouse inoculation in 299. 2,573 were budgerigars and 210 were infected; 293 were pigeons and 15 were infected. The significance of enlarged spleen in infected birds was discussed.—R.M.

Dougherty, R. M., McCloskey, R. V. & Stewart, R. B. (1960). **Analysis of the single dilution method of titration of psittacosis virus.**—J. Bact. **79**, 899-903. [Authors' summary modified.] **3289**

Titrations of a frozen batch of psittacosis virus in eggs obtained from different flocks, and from the same flock at different times revealed significant differences in susceptibility, both from flock to flock and from time to time. Survival time after injection of virus into different groups of eggs may vary greatly. It is therefore impossible to compare titrations based on survival time alone when the titrations are done at different periods. A method of titration is described which allows estimates of potency based on survival time of eggs following injection of a single dose of virus, combined with standard LD_{50} titration.

Moore, R. W. & Watkins, J. R. (1960). **The comparative effects of chlortetracycline and oxytetracycline in the treatment of turkeys with ornithosis.** — J. Amer. vet. med. Ass. **136**, 565-568. [Authors' summary modified.] **3290**

Turkeys aged 8 weeks were inoculated with the Jo strain of psittacosis virus. Oxytetracycline was unsatisfactory for therapy at 200 g./ton whereas this dosage of

chlortetracycline did eliminate the agent from the tissues. Oxytetracycline prevented the isolation of the organism when fed at 600 g./ton for 3 weeks.

Simonyi, E. (1960). Vírusellenes vérsavók értékmérése egyrétegű vesesejt-tenyészetben. **[Titration of anti-viral serum in monolayer kidney cell cultures.]** — Mag. állator. Lapja **15**, 50-51. [In Hungarian. Summaries in English and Russian.] **3291**

Evaluation of various immune sera against canine virus hepatitis and Aujeszky's disease was carried out with virus neutralization tests on trypsinized monolayer kidney tissue cultures. The preparation of the cultures and virus antigen, the technique of adaptation of the virus to culture and of the tests, are described. The tests were repeated in the case of one serum and the same results were obtained. The accuracy of the test was superior to biological tests and was also more rapid and cheaper and was therefore adopted by the author for routine evaluation of immune sera against these two diseases.
—A. Sebesteny.

Zettl, K. (1960). Beobachtungen über das Vorkommen von Ricolesia bovis in Nordhessen. **[Occurrence of Ricolesia bovis (Rickettsia conjunctivae) in cattle in North Hesse.]**—Vet.-med. Nachr. No. 1 pp. 28-35. **3292**

Conjunctival smears from cattle with keratoconjunctivitis on 8 farms contained *R. conjunctivae*. The organism was also found in smears from unaffected cattle, pigs and horses kept in the same buildings. None of the pigs and horses and only some of the cattle developed symptoms; these were usually young animals. Extracts of flies captured on the premises were injected i/p into mice. After several passages the liver of the mice yielded rickettsia. Symptoms did not develop in sheep after infected conjunctival secretion had been dropped on to the intact conjunctiva. All animals treated with 1% chloramphenicol eye ointment recovered completely in a week.
—M.G.G.

See also absts. **3442** (report, Colonial Committee, Agricultural Research Council); **3443** (report, Bahamas).

IMMUNITY

Albertsson, P-Å. & Philipson, L. (1960). **Antigen–antibody in liquid two-phase systems: a method for studying immunological reactions.** —Nature, Lond. **185**, 38-40. **3293**

A study of the precipitin reaction of the protein phycoerythrin and its rabbit antiserum, in the phase systems dextran–methylcellulose and dextran–polyethylene glycol, revealed an increased sensitivity of measurement of the antigen–antibody reaction in the antigen excess zone. Neither polymer had any effect on the immunological reaction.—W. E. Parish.

Christian, C. L. (1960). **Studies of aggregated γ-globulin. I. Sedimentation, electrophoretic and anticomplementary properties. II. Effect in vivo.** — J. Immunol. **84**, 112-116 & 117-121. **3294**

Heating of human gamma globulin at 56°C. for 30 min. resulted in the formation of aggregates. When this heated γ globulin was fractionated and concentrated the aggregates of γ globulin were present in 2 of the 6 fractions. The concentrated fractions were anticomplementary, and these aggregates may be the cause of anticomplementary activity in some heated samples of human sera. Evidence of this was obtained by absorbing g.pig serum with solid γ globulin, which resulted in the removal of certain components of complement, resembling its inactivation by an immune system.

Intradermal injection of the fractions containing aggregates in the g.pig, rat and man produced inflammatory changes which were not produced by the non-aggregated fractions. Intravenous inj. of g.pigs with the aggregates of γ globulin resulted in a depression of the haemolytic activity of the complement.—W. E. Parish.

Portmann, A., Plommet, M. & Auclair, J. (1960). Le caractère immunologique des lacténines du lait de vache. **[Immunological characteristics of lactenins of cow's milk.]**—Ann. Inst. Pasteur **98**, 902-908. [English summary modified.] **3295**

Three cows have been inoculated with 3 strains of lactic acid streptococci: two sensitive to and one resistant to lactenins. The concentration of the inhibitory substances (lactenins) active on these 3 strains was measured, before and after immunization, in the blood and milk of the cows.

In both cows inoculated with sensitive strains, the conc. of the inhibitors, specific for the strains injected, greatly increased in blood and milk about 30 days after the first injec-

tion. For the cow inoculated with the resistant strain, an increase of the inhibitory power of the blood was noted against the strain, but the milk failed to inhibit it.

These results confirm that some of the inhibitory substances (lactenins) of cows' milk must be considered as antibodies. [See also *V.B.* **30,** 1858.]

Podliachouk, L., Sirbu, Z., Kownacki, M. & Szeniawska, D. (1960). Les groupes sanguins des chevaux. Étude comparative des sérums de référence. [**Blood groups of horses. Comparison of reference sera from five European countries.**]—Ann. Inst. Pasteur **98,** 861-867. [English summary modified.] **3296**

A comparative study of standard sera used for the demonstration of blood group antigens in France, Sweden, Roumania, Poland and the United Kingdom shows that the number of equine iso-agglutinins does not seem to be very high. The agglutinins demonstrated by iso-immunization or by iso-immunization of the mother, are generally different from the natural iso-agglutinins.

Gilman, M. A., Schwarz, A. & Wallerstein, H. (1960). **Immunohematologic studies of the Thoroughbred horse.**—Amer. J. vet. Res. **21,** 393-396. [Authors' summary modified.] **3297**

Blood of 1,100 Thoroughbred horses was studied and six basic testing sera were found, to test for the presence or absence of six different iso-antigens in the r.b.c. of the horse.

Theoretically, Thoroughbred horse's blood can be any one of 56 types, although so far only 24 different types of blood have been identified in 102 horses tested by random sampling.

The great majority of horses have no demonstrable iso-antibodies in their blood serum.

From the limited number of families of horses studied, it seems that inheritance of the antigenic properties of r.b.c. is similar to that in man.

Multiple whole blood transfusions based on selection of group specific blood may be safely given.

See also absts. **3131** (antitoxic immunity in staphylococcal infection); **3134** (strangles); **3140-3145** (TB.); **3150** (bovine pasteurellosis); **3154** (colibacillosis); **3156-3157** (antigens of E. coli); **3158** (antigenic structure of Enterobacteriaceae); **3167-3178** (brucellosis); **3180-3181** (leptospirosis); **3200** (trypanosomiasis); **3203** (trichomoniasis); **3212** (serological examination of slaughter animals for toxoplasmosis); **3219-3226** (F. & M. disease); **3227-3229** (Aujeszky's disease); **3230-3233** (rabies); **3238** (pigeon pox vaccine); **3239** (pox viruses); **3241** (interferon); **3244** (avian encephalomyelitis); **3249-3254** (rinderpest); **3261** (swine fever); **3262** (vesicular exanthema); **3263** (parainfluenza virus serum); **3264-3265** (hard pad and distemper); **3266** (canine virus hepatitis); **3272, 3279 & 3281** (Newcastle disease); **3283** (avian bronchitis); **3291** (titration of anti-viral serum in kidney cell culture); **3325** (helminth parasites).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Shemanchuk, J. A., Haufe, W. O. & Thompson, C. O. M. (1960). **Anemia in range cattle heavily infested with the short-nosed sucking louse, Haematopinus eurysternus (Nitz.) (Anoplura: Haematopinidae).** — Canad. J. comp. Med. **24,** 158-161. [Authors' summary modified.] **3298**

In Alberta, severe anaemia was observed in cattle heavily infested with *H. eurysternus.* The mean r.b.c. count in blood samples from 19 clean and 23 heavily infested animals was 715 x 10^4 and 355 x 10^4 cells per cu. mm., respectively. The haemoglobin concentrations were 14·1 and 7·7 g. per 100 ml., respectively. When the lice were destroyed, the anaemia began to improve and the blood was normal in 36 to 50 days. In 15 weeks the r.b.c. counts and the Hb content were significantly higher in a "loused" group of steers than in an infested group. Blood transfusions alone were of little value. In one infested animal the r.b.c. count and Hb content increased only slightly after a transfusion of 3,800 ml. whole blood. In heavily infested cattle, six abortions and five deaths from exhaustion are reported.

Shanahan, G. J. (1960). **Selection for high-order resistance to "Dieldrin" in Lucilia cuprina Wied.**—Nature, Lond. **186,** 100. **3299**

Strains of *L. cuprina,* free from susceptible and from hybrid phenotypes, may be obtained with one generation of selection from partially resistant strains, provided that the parent lines contain a proportion of males and females which tolerate the high male and female discriminating dosages. The selection procedure adopted is as follows: flies from heterogeneous strains are allowed to emerge from batches of pupae on the first day into colony cages, after which the larger unhatched pupae are isolated. Female flies mainly hatch from the segregated pupae on the second day and are supplied with sugar water and sliced liver. The high male discriminating dose (2 μg./fly) is applied to the male flies of the first day hatching when they are about 12 hours old; males surviving 24 hours after treatment are mated to virgin female flies which have hatched overnight. The female high discriminating dose (4μg./fly) is applied to the female flies 3–5 days after emergence.

Male and female progeny from the selection tolerate their respective high discriminating doses without mortality. It was further observed that the progeny of flies, found by the application of the high discriminating doses, tolerate significantly larger amounts of dieldrin than the parents.—T.E.G.R.

Urquhart, G. M. & Hay, D. (1960). **Warble larvae in Grant's gazelle.**—Vet. Rec. **72,** 256. **3300**

About 100 larvae were present under the skin of a Grant's gazelle shot in Kenya. The identity of the larvae is under investigation. One larva was present in 1 of 2 immature males shot in the same area while in 2 mature males whitish rounded scars (which could have been caused by larvae) were observed in the fascia covering the longissimus dorsi muscles. It is considered that this may be the first record of warble-fly larvae in indigenous cloven-hoofed animals in East Africa.—T.E.G.R.

Bruce, W. N., Moore, S. & Decker, G. C. (1960). **Face fly control.**—J. econ. Ent. **53,** 450-451. [Authors' abst. modified.] **3301**

Face flies *(Musca autumnalis)* became numerous in northern Illinois during summer 1959. Large-scale treatment of farm premises and animals gave no effective control. Repellent treatments with R-326 (di-*n*-propyl isocinchomeronate) or Tabatrex (di-*n*-butyl succinate) gave satisfactory control. Treatments consisting of 1% to 2% dimethoate and/or 0·1 to 0·2% DDVP in a syrup bait applied to the foreheads of cattle at an average dose of 3 ml. a cow eliminated most flies.

Radeleff, R. D. (1960). **Problems associated with the use of the newer insecticides for livestock pests.**—J. Amer. vet. med. Ass. **136,** 529-537. [Author's summary modified.] **3302**

Problems associated with the development of successful insecticides, particularly those with systemic activity, include freedom from residues in animal products used for food, control of absorption and elimination, methods of administration, compatibility of drugs, and toxicity. Also of importance are the problems of host insult caused by dead parasites.

Two presently available insecticides with systemic activity, ronnel and Bayer 21/199, satisfy these requirements reasonably. Other such materials are close to perfection.

Bekker, P. M. (1959). Dipstof en dipping. 'n oorsig oor die aard en gebruik van dipstof vir die bestryding van bosluise op beeste, vir die tydperk 1889 tot 1959 in Suid-Afrika. **[Cattle dips and dipping. A history of their development in S. Africa from 1889-1959.]**—J. S. Afr. vet. med. Ass. **30,** 353-380. [In Afrikaans. Abst. from English summary.] **3303**

B. reviewed the origin and development of dips and dipping of cattle, over 70 years, in S. Africa. During the first phase (1889–1910) work was especially done concerning the ticks as carriers of disease and the development of an effective dip, arsenic, to control it. The second phase (1910–1940) can be regarded as one of applying acquired knowledge and enforcing a policy of tick eradication by dipping in arsenic. During the last period (1940–1959) work has been concerned with the arsenic resistant blue tick and with the development of the new synthetic dips.

An attempt is made to refer to contributions of all persons who helped in making dipping history in South Africa.

A full-length but slightly popularized English version will appear in *Veld,* Vol.XX, No. 2 onwards published by Cooper & Nephews S. Af. (Pty.), Ltd., P.O. Box 4557, Johannesburg.

Du Toit, R. & Fielder, O. G. H. (1959). **The control of the itch mite of sheep (Psorergates ovis) with dips containing delta BHC.** — J. S. Afr. vet. med. Ass. **30,** 419-425. [Authors' summary modified.] **3304**

From tests in which *Ps. ovis* mites were exposed to serial dilutions of the delta isomer of BHC and also to varying combinations of the delta and gamma isomers in a bland mineral oil (to demonstrate the antagonistic effect of the gamma isomer upon the delta), it was concluded that a ratio of 4 parts of the delta to 1 part of the gamma isomer was suitable for eradication of *Psorergates* mites as well as gamma susceptible ectoparasites such as scab mites, keds and lice. A dip containing the delta and gamma isomers of BHC in the ratio of 4 : 1 was tested in the field and it was shown that a single dipping would eradicate infectious itch provided the wool at the time of dipping is not over half an inch and the concentration of the delta isomer is not allowed to drop below 600 p.p.m.

A table indicates the extent to which the delta isomer is removed selectively during dipping of sheep carrying 5 months' wool.

Weisbroth, S. H. (1960). **The differentiation of Dermanyssus gallinae from Ornithonyssus**

sylviarum. — Avian Diseases **4,** 133-137. [Author's summary modified.] **3305**

Rapid differentiation could be made on the basis of the anal plate structure, which in *Ornithonyssus* is "tear-drop" in outline, while in *Dermanyssus* it is in the shape of a keystone. The limitations of this method of identification are discussed.

See also abstr. **3242** (tick-borne encephalitis and louping ill); **3448** (book, review of biological control of insects and weeds in Australia and New Guinea).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

Rowcliffe, S. A. & Ollerenshaw, C. B. (1960). **Observations on the bionomics of the egg of Fasciola hepatica.**—Ann. trop. Med. Parasit. **54,** 172-181. [Authors' summary modified.] **3306**

Temperature, moisture and the presence of faeces were the most important factors influencing the development and hatching of the egg of *F. hepatica.* The way in which these may influence development of the egg in the field is discussed. It is considered that climatic temperature and moisture variations play an important role in the hatching of the fluke egg, and in consequence in the production of fluke disease in Gt. Britain.

Dinnik, J. A. & Dinnik, N. N. (1959). **Effect of the seasonal variations of temperature on the development of Fasciola gigantica eggs in the Kenya Highlands.**—Bull. epiz. Dis. Afr. **7,** 357-369. [Summary in French.] **3307**

Eggs of *F. gigantica* from the bile of slaughtered cattle were washed and kept out of doors in beakers filled with water. Development of the embryo into the miracidium occurred at all seasons of the year but actual hatching rarely occurred in the cold season (June to December) when water temperature ranged from 4·5° to 21°C. During the warm season (water temp. from 10° to 24°C.) development took 52–70 days compared with 109 days during the cold season. Mortality of embryos during the cold season was almost five times greater than during the warm season when it was 10%. The embryo was particularly susceptible to low temp. in the early stages of its development. Hatching of miracidia in cultures maintained outside, occurred gradually over a period of days. Miracidia which remained in eggs up to 90 days were capable of hatching and infecting snails although the number hatching decreased with time. Those remaining in eggs for 105 days during the cold season did not survive.—C. B. Ollerenshaw.

Funnikova, S. V. (1959). **[Trials of two inorganic phosphorus compounds (tetraethylmonothiophosphate and tetraethyldithiophosphate) to control snail hosts of helminth parasites.]** — Trudy Kazan. nauchno-issled. vet. Inst. **13,** 387-397. [In Russian.] **3308**

The first preparation was named pirophos and the second dithiophos. Their action was tested on *Lymnaea stagnalis, Galba palustris* and *Radix lagotis.* 0·15% aqueous emulsion of pirophos killed all snails in 42 hours and 80–90% within 24 hours; 0·1% killed all snails in 118 hours and 75% in 70 hours. Dithiophos was slightly less effective. Further experiments showed that 1 : 50,000 or 1 : 500,000 concentrations of pirophos killed 90–100% of snails within 72 hours. 81% of snails on pastures sprayed with 0·001% aqueous emulsion died within 185 hours. *Radix* was more resistant to the compounds than the other snails.—R.M.

Froyd, G. & Round, M. C. (1960). **The artificial infection of adult cattle with Cysticercus bovis.**—Res. vet. Sci. **1,** 275-282. [Authors' summary modified.] **3309**

Eggs and artificially hatched oncospheres of *T. saginata* were used.

Eggs were effective in establishing oral infections in young calves, but 14 cattle varying in age from 1½–5 years failed to become infected. 11 of the older cattle were already infected.

Infection was established in 13 out of 26 animals injected s/c or i/m with hatched oncospheres, but 7 others injected by the intravenous and epidural routes failed to become infected. 14 animals were already infected with *C. bovis.*

It is suggested that the intestinal phase of immunity to cysticercosis in cattle may be more important than the humoral phase. In the experiments the intestinal phase of immunity was probably by-passed, in that infections of *C. bovis* were established in adult cattle under the skin or in the musculature.

Lucker, J. T. & Douvres, F. W. (1960). **Survival of Taenia eggs on stored hay.**—Proc. helm. Soc. Wash. **27,** 110-111. **3310**

Chains of proglottids and free eggs of *Taenia saginata* were divided into aliquots

consisting of: 6 mature proglottids; 6 whose maturity was doubtful; and about 180,000 free eggs. Of these aliquots one was used as control and the others were used to contaminate samples of lucerne-hay (in test tubes stored in bales of hay for varying periods) and fed to calves which were later slaughtered for examination. It is concluded that a small percentage of the eggs retain their viability in hay for about 3 weeks; none survive for 10 weeks, dessication probably being responsible for loss of viability.—T.E.G.R.

Castel, P., Gras, G. & Beaulaton, S. (1960). Recherches sur l'activité anthelmintique et la toxicité de l'oxyde d'étain diphényle. **[Anthelmintic activity and toxicity of diphenyl tin oxide.]**—Rev. Path. gén. **60,** 235-243. [Summaries in English and Spanish.] 3311

Twenty rats given 100 mg./kg. body wt. of diphenyl tin oxide by mouth were rid of *Hymenolepis fraterna* infestation. The rats survived the dose, but 5 of 10 given 200 mg./kg. died. No symptoms of toxicity were seen in sheep given 150 mg./kg. by mouth.
—M.G.G.

Poynter, D. (1960). **The arterial lesions produced by Strongylus vulgaris and their relationship to the migratory route of the parasite in its host.** — Res. vet. Sci. **1,** 205-217. [Author's summary modified.] 3312

P.M. examinations on 43 naturally infected horses gave information on the distribution, nature and development of the arterial lesions. It is concluded that *S. vulgaris* travels through the heart and returns by the intestinal vessels to the gut.

Batte, E. G., Harkema, R. & Osborne, J. C. (1960). **Observations on the life cycle and pathogenicity of the swine kidney worm (Stephanurus dentatus).** — J. Amer. vet. med. Ass. **136,** 622-625. [Authors' summary modified.] 3313

Pigs may become infected by 3 avenues: ingestion of infective larvae, penetration of unbroken skin, and by access to infected earthworms. Regardless of avenue of infection, the immature worm spends 4 to 9 months in the liver. Those not trapped by encapsulating tissue migrate to regions near the ureters.

The long life of this parasite is indicated by its requiring 9 to 16 months to reach patency, with infection persisting in a sow for at least 24 months.

Infection in pigs and experimental infection of calves results in verminous hepatic and pancreatic abscesses, extensive fibrosis, and marked eosinophilia.

Vacirca, G., Cantoni, O. & Mucci, G. (1959). La terapia della tricocefalosi ed anchilostomiasi canina con joduro di 3-3¹-dietiltiadicarbocianina (ditiazanina). **[Dithiazanine in the treatment of Trichocephalus and Ancylostoma infestation in dogs.]**—Atti Soc. ital. Sci. vet. **13,** 354-357. [Summaries in English and French.] 3314

The drug was effective in treating 27 dogs infested with *A. canis,* 26 with *T. vulpis* and 14 with mixed infestation. It was given by mouth at 10 mg./kg. body wt. daily for 5 days. The daily dose was divided into two portions.
—R.M.

Muller, G. L. (1959). **On the differential diagnosis of the third stage (infective) larvae of Chabertia ovina and Oesophagostomum spp. (O. columbianum and O. venulosum) with special emphasis on the characteristic lengths of C. ovina.**—J. S. Afr. vet. med. Ass. **30,** 427-435. [In English. Author's summary modified.] 3315

The infective third stage larvae of *C. ovina, O. columbianum* and *O. venulosum* may be differentiated and fairly accurately classified from:—(a) Total length. (b) Length from anus to tip of sheath. (c) Tip of larval tail to tip of sheath. (d) Number and shape of intestinal cells especially between *C. ovina* and *O. columbianum.* For routine examination total length is the main criterion for identification.

Ordinary low power magnification of the microscope can be used, thus saving time when a large number of routine cultures is involved.

I. Kates, K. C. & Turner, J. H. (1960). **Experimental trichostrongylosis (axei) in lambs, with a discussion of recent research on this disease in ruminants.** — Amer. J. vet. Res. **21,** 254-261. 3316

II. Leland, S. E., Jr., Drudge, J. H., Wyant, Z. N. & Elam, G. W. (1960). **Studies on Trichostrongylus axei (Cobbold, 1879). V. Some quantitative and pathologic aspects of experimental infections with a horse strain in sheep.**—Ibid. 449-457. 3317

I. The pathogenesis of *T. axei* was studied in six lambs given single doses of infective larvae, ranging from 50,000 to 500,000. Five lambs developed fatal infections, whilst the sixth was less severely

affected and survived. The clinical effects included anorexia, diarrhoea, emaciation, weakness, marked loss of weight and polycythaemia and were seen as early as two weeks after infection indicating that immature worms can produce clinical disease. At P.M. examination the carcasses were emaciated, dehydrated and there was evidence of haemoconcentration. Abomasitis and duodenitis were evident and the worm burdens varied from 5,720 to 45,862 and were inversely related to the number of larvae administered. Histologically the most important findings were erosion of the abomasal mucosa with oedema of the submucosa and ulceration of the mucosa.

The authors discuss their results in relation to those of other workers. They point out that strains of *T. axei* do not differ in virulence whatever their origin. Natural cases similar to those experimentally produced have been recorded by many workers. There is evidence that a single dose of larvae produced more acute disease than the continued administration of many smaller doses and there is some evidence that the type of haematological change which occurs is related to the severity of the disease. The m.l.d. for lambs, appears to be 50,000 larvae and for calves 500,000. There is no clear evidence of the mechanism by which the nematode produces its pathogenic effects.

II. The pathogenesis of a strain of *T. axei,* from horses, was studied in 19 sheep aged 76–657 days at time of infection. Number of larvae administered ranged from 50,000 to 1,500,000 and the LD_{50} was estimated as 580,000 larvae. 250,000 larvae were required to produce clinical signs which included reduced consumption of food and water, progressive cachexia, listlessness, loss of wool resiliency, and progressive weakness. 7 sheep died from 20 to 97 days after infection. The average prepatent period was 23 days. Pathological changes in the abomasal mucosa were first observed at the 50,000 dose level, 74 days after infection, and consisted of scattered mildly hyperaemic areas. As the number of larvae increased to 250,000 or more, severe changes were observed ranging from extreme hyperaemia to erosion of the mucosa. Ringworm-like lesions were seen in only one yearling. Extensive haematological observations were carried out. Packed red cell volume was elevated for one to six weeks after infection but dropped to the subnormal range in all animals which survived longer than nine weeks. Haemoglobin and total red cell counts followed a similar course but mean corpuscular volume and total leucocyte counts remained within normal limits. Eosinophilia was observed in 6 of 10 animals, 2 weeks after infection, reaching its maximum 4–8 weeks after infection and then decreasing to normal. Animals which survived the initial infection were strongly immune to repeated massive challenge. Eosinophilia recurred more rapidly after re-infection and was more severe. The authors compared their results with those of others and concluded that the equine strain of *T. axei* appeared to be less pathogenic for sheep than bovine or ovine strains.

—T. E. Gibson.

Thomas, R. J. & Stevens, A. J. (1960). **Ecological studies on the development of the pasture stages of Nematodirus battus and N. filicollis, nematode parasites of sheep.**—Parasitology **50,** 31-49. [Authors' summary modified.] **3318**

The availability of *Nematodirus* infection was followed by grazing worm-free lambs on a contaminated plot. Lambs did not become infected during the summer on pasture contaminated in the spring, but became infected when grazed on the plot the following spring.

The development and hatching of the eggs and larval stages of *N. battus* and *N. filicollis* were followed by examination of infected faeces set out during May–November. Development to the infective larval stage occurred during the summer, taking normally about 3 months, but the larvae then remained dormant until the following spring.

Laboratory studies confirmed that the hatching of the infective larvae was a response to a rise in temperature in the spring, following sensitization by exposure to low temperature during the winter. A rise to 50°F. was necessary before a high percentage hatch occurred.

The epidemiology is discussed in relation to these observations.

Kraft, H. (1960). Magenwurmbefall (Haemonchus contortus) bei einem Chinchilla velligera (Prell). **[Haemonchus contortus as the cause of death in a chinchilla.]**—Kleintier-Praxis **5,** 61. **3319**

The animal had been given grass from a pasture previously grazed by sheep.—R.M.

Herlich, H. (1960). **Age resistance of cattle to nematodes of the gastrointestinal tract.**—J.

Parasit. **46**, 392-397. [Author's summary modified.] 3320

31 cattle (13 calves from 5 to 8½ months old and 18 steers from 18 to 25 months old) were used. In three experiments, 22 were grazed on contaminated pasture and became infected with some 8 species of gastro-intestinal nematodes. In one experiment, 9 of the cattle were kept in a barn and artificially infected. The results indicated that by virtue of age, the adult cattle were generally more resistant to the debilitating effects of nematode parasites than the calves. The individual adult animals did however acquire appreciable numbers of nematode parasites.

Levine, N. D., Mehra, K. N., Clark, D. T. & Aves, J. (1960). **A comparison of nematode egg counting techniques for cattle and sheep feces.**—Amer. J. vet. Res. **21**, 511-515. 3321

A comparison was made of the efficiency of the McMaster egg counting and the direct centrifugal flotation techniques for the recovery of worm eggs from sheep and cattle faeces, using samples from 78 cattle and 13 sheep. The McMaster method was the more accurate and rapid, giving results equivalent to those obtained from a direct counting of the total eggs in a given sample. With different flotation media 11–56% of the eggs counted by the McMaster method were recovered by the D.C.F. method. The flotation solutions used were Sheather's sugar solution, 331 g. per litre zinc sulphate, saturated zinc sulphate and saturated sodium nitrate; there was no significant difference in the efficiency of these different solutions. In the McMaster method Sheather's sugar soln. was used as the flotation solution.—T. E. Gibson.

Drudge, J. H., Leland, S. E., Jr., Wyant, Z. N., Elam, G. W. & Hutzler, L. B. (1960). **Field studies comparing piperazine-carbon disulfide complex with carbon disulfide for parasite control in the horse.**—Amer. J. vet. Res. **21**, 397-402. 3322

The efficiency of the two compounds for the control of ascarid and strongylid worms was compared in field trials using 66 foals on three farms in Kentucky. The value of the anthelmintics was judged by fortnightly faecal egg counts before and for ten weeks after treatment. In unweaned foals the piperazine-carbon disulphide complex was superior for the control of ascarids. The ineffectiveness of the carbon disulphide was attributed to the presence of milk in the stomach despite muzzling for three hours before and two hours after treatment. Carbon disulphide was without apparent action in some animals and gave incomplete clearance of mature and immature ascarids in all treated animals. The piperazine-carbon disulphide complex was superior when given at a dose rate of 22 mg. per kg. piperazine base per kg. body wt. but twice this dose was necessary for full efficacy. By contrast the two compounds were equally effective for the removal of mature and immature ascarids when used in weanlings and yearlings. On one farm trials were carried out with 6 foals using piperazine citrate at 88 mg. of piperazine base per kg. body wt. and with this compound, complete removal of mature and immature ascarids was achieved in both the unweaned and weaned. Piperazine dihydrochloride was used in yearlings, 3 receiving 44 mg. of base per kg. and 3 receiving 88 mg. of base per kg. Action against ascarids was significant but incomplete. The various dose levels of the piperazine compounds were all successful in reducing the count of strongylid eggs for 4 weeks after treatment. This successful action was however achieved because the infestations consisted mainly of small strongyles.

—T. E. Gibson.

Keeling, J. E. D. (1960). **The effects of ultra-violet radiation on Nippostrongylus muris. I. Irradiations of infective larvae: lethal and sublethal effects.**—Ann. trop. Med. Parasit. **54**, 182-191. [Author's summary modified.] 3323

Infective larvae of *N. muris* were exposed to radiations from a cold cathode mercury-vapour resonance lamp with an output of 15 microwatts per cm.^{2} emitting over 80% of its ultra-violet radiation in the region of 2,537 A. An exposure of 4 min. at a distance of 0·5 cm. was sufficient to immobilize all larvae irreversibly. Larvae which had received smaller doses and appeared normal were incapable of reaching maturity after inoculation into young rats. When an aqueous suspension of larvae, 4 mm. deep, was exposed at 8 cm. for 32 sec., the larvae did not complete their development in rats. At a distance of 8 cm., with the larvae absorbed on to a filter-paper 'irradiation mat,' exposure for 16 sec. completely inhibited development to the adult stage. It is concluded that the suspending medium protected the larvae from the full effects of radiation. This may be interpreted as evidence of direct action of radiation on the larvae.

Kakuk, T. (1960). Ujabb adatok a csirkék syngamosisának a gyógykezeléséhez. **[Treatment of syngamosis in fowls.]**—Mag. állator. Lapja **15**, 47-50. [In Hungarian. Summaries in English and Russian.] **3324**

350 chicks (4–8 weeks old and weighing 150–200 g.) with severe *Syngamus trachea* infestation were treated with a single oral dose of 0·4–2 ml. of a 1 : 3 mixture of carbon tetrachloride and liquid paraffin. 110 of them received an additional dose of 0·4–1·2 ml. s/c or i/m. Apart from transient depression no toxic effects were observed. 7 chicks, however, died from suffocation by dead entangled worms. P.M. examination of these and clinical examination of the other treated birds suggested that the mixture removed a large proportion of worms and alleviated severe symptoms, even in the smallest doses, but complete removal of the worm burden and clinical cure could not be achieved even with the largest doses of the mixture.

190 chicks were treated with barium antimonyl tartrate dust inhalation. A description of the preparation of B.A.T., and the apparatus, technique and inhalation dosage is given. Apart from 2 chicks which died soon after treatment, complete clinical recovery was observed in the flock in 4 days, and no worms were found in the 2 birds killed 7 days after treatment.—A. Sebesteny.

Jarrett, W. F. H., Jennings, F. W., McIntyre, W. I. M., Mulligan, W. & Urquhart, G. M. (1960). **Immunological studies on Dictyocaulus viviparus infection. I. Active immunization with whole worm vaccine. II. Immunity produced by the administration of irradiated larvae.**—Immunology **3**, 135-144 & 145-151. [Authors' summaries modified.] **3325**

I. Experiments on the vaccination of calves against *D. viviparus* infection using whole worm antigen in Freund's adjuvant are described. A reduction in the number of worms developing from a challenge infection was sometimes obtained but the method seems to be of little practical value.

II. Experiments are described on the immunity to *D. viviparus* infection produced by the administration of 3rd stage *D. viviparus* larvae partially inactivated by X-irradiation. A high degree of immunity was obtained by this method.

Korthals, A. & Shenman, G. (1960). **The lungworm Protostrongylus rufescens in Australia.**—Nature, Lond. **185**, 941. **3326**

Identification of *P. rufescens* in the lungs and its larvae in the faeces of sheep in south-eastern Australia is reported. Larvae were also demonstrated in the abomasum of a sheep in south-west Australia, and the large numbers of adults recovered (about 600 in one sheep) indicate that the helminth is not rare. The worm is anatomically similar to that described by Gerichter but somewhat smaller.—T.E.G.R.

Kassai, T. & Holló, F. (1960). Vizsgálatok a szarvasmarha- és a sertés-tüdofergesség orvoslásáról. **[Treatment of lungworm infestation in cattle and pigs.]**—Mag. állator. Lapja **15**, 81-84. [In Hungarian. Summaries in English and Russian.] **3327**

The efficacy of Hungarian cyanacethydrazide, Russian ditrazin phosphate (diethylcarbamazine phosphate), British "Franocide" (diethylcarbamazine citrate) and German "Benecid" (cyanacethydrazide) on *Dictyocaulus viviparus* and metastrongyles was tested in the field on heavily infested cattle aged 9–18 months and on piglets weighing 6–27 kg. Efficacy was estimated by faecal larva counts before and 10–14 days after treatment and by a small number of P.M. examinations. 55 cattle and 18 piglets were treated with the Hungarian drug, 13 cattle with ditrazin, 4 cattle with "Franocide" and 17 cattle with "Benecid," while 52 cattle and 10 piglets were controls. Hungarian cyanacethydrazide was unsatisfactory against sheep and pig lungworms, but the foreign preparations were 50–100% effective against lungworms in cattle. No undesirable side effects were seen.—A. Sebesteny.

Mackenzie, A. (1960). **Pathological changes in lungworm infestation in two cats with special reference to changes in pulmonary arterial branches.**—Res. vet. Sci. **1**, 255-259. [Author's summary modified.] **3328**

Two 12-week-old kittens which died were heavily parasitized with *Aelurstrongylus abstrusus*. The extensive pulmonary lesions consisted of discrete or confluent yellowish, semi-caseous consolidated areas that contained masses of developing lungworm eggs and larvae.

Histological changes in the lungs included focal cellular and degenerative reactions in the vicinity of the parasites, the occurrence of giant-cells and small granulomas, round cell infiltration and perivascular lymphoid hyperplasia.

Pronounced hypertrophy and hyperplasia

of the smooth muscle of the media of pulmonary arteries also occurred and its significance in relation to similar lesions described in older cats is discussed.

Vodrazka, J. (1960). **Part I—A new method for critical evaluations of anthelmintics used for treatment of lungworms.**—Vet. Rec. **72,** 404-405. 3329

Vodrazka, J., Sokol, J. & Berecky, I. (1960). **Part II—Critical tests with cyanacethydrazide against the sheep lungworms—Dictyocaulus filaria and Protostrongylus rufescens.**—Ibid. 405-408. 3330

I. This is a modification of the method used by Walley [*Vet. Rec.* **69,** 850] for evaluating the efficacy of cyanacethydrazide. The trachea is completely severed and the cut end attached to a plastic tube to which is attached a gauze bag for collecting worms expelled from the lungs.

II. Using this method, subcutaneous injection of cyanacethydrazide at various dose rates was found to be highly effective against *Dictyocaulus filaria* in sheep carrying light infestations, but ineffective against *Protostrongylus rufescens.*—J. H. Rose.

Jordan, R. & Vaughn, J. (1960). **Intestinal nematodes in well-cared-for dogs.**—Amer. J. trop. Med. Hyg. **9,** 29-31. 3331

Examination of 170 fresh dog stools collected from the pavements of 100 residential blocks in an exclusive district of New Orleans revealed *Toxocara* eggs in 8%, hookworm in 52% and *Trichuris* in 16%. Similar results were obtained with 325 samples from dogs in veterinary hospitals in the city. The findings agree with those obtained from stray dogs in the same area by Hinman & Baker in 1936. —R.M.

Ashton, N. (1960). **Larval granulomatosis of the retina due to Toxocara.** — Brit. J. Ophthal. **44,** 129-148. 3332

Larvae of *T. canis* were identified in eyes removed surgically from 4 children. In each case the lesion was thought to be neoplastic until histological examination revealed fragments of worm larvae.—R.M.

Funnikova, S. V. (1959). **[Treatment of Setaria equina infection in horses with antimony compounds.]**—Trudy Kazan. nauchno-issled. vet. Inst. **13,** 428-438. [In Russian.] 3333

Larvae in samples of horse blood were killed by exposure to 6% soln. of tartar emetic for 2 hours, 4% for 2·5 hours, or 0·1% for 5 hours. Up to 6% of sodium antimony gluconate (solustibosan) did not affect motility of the larvae. The greatest number of larvae appeared in the blood of infected horses during April, May or June in Kazan. Treatment with 2% tartar emetic soln. consisting of i/v inj. of up to 100 ml. daily for 3 days was carried out in June. During March–May of the following year blood examinations were negative in 10 of 19 treated horses. In those that remained infected, the number of larvae in 1 ml. of blood was a quarter that of the previous year. Treatment with solustibosan had no influence on larvae in the blood or adults in the abdominal cavity.—R.M.

Allen, A. M. (1960). **Occurrence of the nematode, Anatrichosoma cutaneum, in the nasal mucosae of Macaca mulatta monkeys.** — Amer. J. vet. Res. **21,** 389-392. [Author's summary modified.] 3334

Seventeen monkeys *(Macaca mulatta)* selected at random at the time of routine necropsy were examined for nasal parasites. Six harboured the nematode *Anatrichosoma cutaneum* in the squamous epithelium and the lamina propria of the nasal mucosa.

While some of the nematodes of the lamina propria were evidently free in the connective tissue, most of them were located within vessels. Chronic inflammatory reaction of minimal to moderate severity was present in the nasal laminae propriae of 5 of the monkeys.

See also absts. **3208** (concurrent coccidiosis and strongyloidosis in calves); **3443** (report, Bahamas); **3444** (report, Netherlands).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

See absts. **3284-3286** (avian leucosis complex); **3449** (atlas of tumour pathology).

NUTRITIONAL AND METABOLIC DISORDERS

Henricson, B. (1960). **Oxytetracycline supplementation of rations for colts.**—Vet. Rec. **72,** 515-516. [Author's summary.] 3335

Daily supplementation with 200 mg. oxytetracycline hydrochloride had no demonstrable effect upon the growth of colts of the

North Swedish breed from weaning up to one year of age.

Barth, K. & Karg, H. (1960). Untersuchungen über die Beeinflussung der Legeleistung bei Hennen mit Triphenylbromäthylen. [**Influence of triphenylbromethylene on egg production in hens.**]—Arch. Geflügelk. **24,** 96-102. [Summary in English.] **3336**

Twelve hens were fed 80 mg. of triphenylbromethylene per kg. of food for 9 weeks. There was no improvement in the already high egg yield nor in food efficiency, but the eggs weighed more than those from 12 untreated hens. Residues of the drug were found in the eggs and in the flesh of the fowls. —M.G.G.

Booth, A. N., Bickoff, E. M. & Kohler, G. O. (1960). **Estrogen-like activity in vegetable oils and mill by-products.** — Science **131,** 1807-1808. [Authors' summary.] **3337**

By the immature female mouse bioassay technique, an increased uterine weight was observed when certain vegetable oils were fed or injected. By-products from the milling of cereals were also capable of eliciting a uterine response.

Perkins, A. E. (1960). **The composition of the blood, urine and saliva of dairy cows as affected by extremes in the level of protein feeding.** — Res. Bull. Ohio agric. exp. Sta. No. 856 pp. 19. **3338**

A group of cows was fed on a ration rich in protein (1 part protein to 2 parts other digestible nutrients), and a second group on a ration poor in protein (1 part protein to 13 parts other nutrients). In the first group the blood content of total non-protein nitrogen was more than twice as high and of urea nitrogen 11 times higher than in the second group. The first group excreted 76 times more urea nitrogen, and 9·6 times more total nitrogen. The ammonia content of the urine was 8 times higher. The saliva of the first group contained 6 times more urea nitrogen and 2½ times more total nitrogen.—M.G.G.

Andrews, E. D., Hart, L. I. & Stephenson, B. J. (1960). **Vitamin B_{12} and cobalt in livers from grazing cobalt-deficient lambs and from others given various cobalt supplements.** —N.Z. J. agric. Res. **3,** 364-376. [Authors' summary modified.] **3339**

It is concluded that the vitamin B_{12} concentration in the liver provides a more sensitive indication than the cobalt concentration, of the presence or absence of cobalt deficiency disease. For sheep a value of 0·2 μg./g. is suggested as an approximation to the minimal liver vitamin B_{12} concentration ("critical level") consistently associated with freedom from cobalt deficiency disease. Tentative vitamin B_{12} diagnostic criteria are given.

Christian, K. R. & Williams, V. J. (1960). **Attempts to produce hypomagnesaemia in dry non-pregnant sheep.**—N. Z. J. agric. Res. **3,** 389-398. [Authors' summary modified.] **3340**

Dosing urea or ammonium acetate (up to 11 g. ammonium nitrogen equivalent) failed to lower serum magnesium or calcium in wethers fed a ration of dried grass. This level of dosing raised blood non-protein nitrogen by 4–14 mg.%, and caused inappetence within a few days.

Serum Mg of sheep which had been fed in sheltered pens on fresh grass, or dried grass, or dried grass plus ammonium acetate fell within one day after the sheep were turned out to spring pasture, but were normal on the 4th day of grazing.

When sheep that had been free grazing were starved in sheltered pens, serum Mg rose within one day but had returned to the original level after 4 days. Serum Ca showed successive falls during this time.

Linear falls in serum Mg and Ca were produced when both lean and fat sheep starved for a few days in a pen exposed to the weather. When the sheep were let out to pasture again, serum Ca returned to normal in 3 days but serum Mg fell still further and was still low after 4 days.

Acute hypomagnesaemia without accompanying hypocalcaemia was not produced by undernutrition or starvation; it is concluded that the observed changes in Mg levels were associated with the change from pens to pastures.

Care, A. D. (1960). **The effect on cattle of high level magnesium supplementation of their diet.**—Vet. Rec. **72,** 517-519. [Author's summary modified.] **3341**

The diet of 4 fattening steers was supplemented with calcined magnesite up to a level of 12 oz. per day. Doses of 6 to 12 oz. per day caused pronounced scouring in all four.

Increases in plasma magnesium and inorganic phosphate were noted with all levels of magnesium oxide feeding. When the supplement in excess of 4 oz. per day per head had been fed for a week a slight average fall

in plasma calcium concentration was noted.

The daily supplementation of the diet of adult cattle up to 4 oz. magnesium oxide per head over 6 weeks is not likely to cause loss of condition or to produce undesirable plasma levels of magnesium, calcium and inorganic phosphate.

Aikawa, J. K. (1960). **Effect of glucose and insulin on magnesium metabolism in rabbits. A study with Mg^{28}.**—Proc. Soc. exp. Biol., N.Y. **103**, 363-366. [Author's summary modified.] 3342

In rabbits which had received by intravenous injection 1 to 2 m. equiv. of magnesium chloride tagged with Mg^{28}, parenteral administration of insulin and glucose significantly accelerated Mg^{28} uptake in bone, kidney, heart, liver, appendix, skin and skeletal muscle. Tissue magnesium content was increased in heart and skeletal muscle. Less striking changes were noted when insulin or glucose alone was given following injection of magnesium. Metabolism of Mg appears to be intimately related to that of carbohydrate and insulin.

Sullivan, T. J. (1960). **Effect of manganese edetate on blood formation in rats.**—Nature, Lond. **186**, 87. 3343

A severe but reversible iron deficiency anaemia was produced in immature but not in adult rats by adding 4% manganese edetate to their diet; the younger the rats the more severe was the anaemia. Reports that manganese may affect blood formation are considered contradictory.—T.E.G.R.

Smith, I. D., Grummer, R. H., Hoekstra, W. G. & Phillips, P. H. (1960). **Effects of feeding an autoclaved diet on the development of parakeratosis in swine.** — J. Anim. Sci. **19**, 568-579. [Authors' summary modified.] 3344

Feeding pigs autoclaved rather than natural untreated rations increased weight gains and feed efficiency, and decreased the severity of parakeratosis. Both rations had a somewhat high calcium content. In affected pigs feeding this autoclaved ration was nearly as effective therapeutically as feeding a Zn supplement.

Pigs fed the autoclaved ration had greater Zn retention and lowered Zn excretion per g. of faeces. These effects appeared to be associated with increased availability of Zn. Feed showed no increase in zinc solubility due to autoclaving.

The level of phytin phosphorus or water-extractable phosphorus was not changed by autoclaving.

Maplesden, D. C., Harvey, J. D. & Branion, H. D. (1960). **Blood plasma tocopherol and phosphorus levels in a herd of beef cattle.**—J. Nutr. **71**, 77-84. [Authors' summary modified.] 3345

In an attempt to establish normal values, total tocopherol and acid-soluble phosphorus were determined in plasma from 27 beef cows over 520 days. This herd had never experienced nutritional muscular dystrophy.

There was a decline in plasma tocopherol during the stable feeding period. The mean levels were 360 ± 101 and 572 ± 189 μg. per 100 ml. for stable and pasture feeding, respectively. The mean plasma inorganic phosphorus values were $5{\cdot}9\pm0{\cdot}08$ and $5{\cdot}7\pm0{\cdot}6$ mg. per 100 ml. for stable and pasture feeding, respectively.

Total tocopherol and inorganic phosphorus were determined on 18 calves born to these cows. The tocopherol levels of the calves in this herd were, at times, below the levels seen by the authors in some clinical cases of muscular dystrophy.

Tustin, R. C. (1959). **An outbreak of white muscle disease in lambs.** — J. S. Afr. vet. med. Ass. **30**, 451-455. [Author's summary modified.] 3346

A small outbreak of white muscle disease in lambs is described. The role of vitamin E and selenium in the aetiology is briefly discussed. The main constituents of the diet of the ewes and lambs were lucerne hay and hay made from ground-nut plants.

Kuttler, K. L. & Marble, D. W. (1960). **Prevention of white muscle disease in lambs by oral and subcutaneous administration of selenium.**—Amer. J. vet. Res. **21**, 437-440. [Authors' summary modified.] 3347

When 27 ewes were given s/c injections of barium selenate at 0·05 g. and 0·10 g. per 100 lb. body wt., their lambs did not develop white muscle disease (WMD), even though the ewes were getting dystrophogenic feed. Selenium, as sodium selenite, when fed at the rate of 0·1 p.p.m. to 6 ewes, beginning about two months after parturition, prevented WMD in their lambs.

A cod-liver oil/skim milk ration containing selenium at the rate of 1·0 p.p.m. (as

sodium selenite) did not prevent the development of high serum glutamic oxalacetic typical of WMD in lambs.

Creger, C. R., Mitchell, R. H., Atkinson, R. L., Ferguson, T. M., Reid, B. L. & Couch, J. R. (1960). **Vitamin E activity of selenium in turkey hatchability.** — Poult. Sci. **39,** 59-63. **3348**

Turkey hens were housed in wire floored pens; for the first 9 weeks of the laying period they were fed a diet low in vitamin E and for the next 12 weeks they were given supplements of dried brewer's yeast, selenium and vitamin E. Yeast (5%) increased fertility but did not affect hatchability. Selenium (0·1 p.p.m.) slightly depressed fertility and did not show a vitamin E-like activity. 10 i.u. of vitamin E per lb. increased fertility and hatchability.—T.E.G.R.

Fowler, M. E. (1960). **Scurvy in an elephant.** —Cornell Vet. **50,** 171-176. **3349**

Workers are finding it increasingly difficult to remember for what animals a vitamin C supplement in the diet is necessary; indeed, in many animals this knowledge is probably not available. This report of scurvy in an elephant associated with vitamin C deficiency is therefore of special interest. A baby elephant was listless for some four months, and had slight anorexia; for six weeks there had been a limp and lameness became progressive; later the animal went down on her hind legs apparently owing to pain in the front legs.

Haematological, biochemical and radiological findings are given. Ascorbic acid was given by i/m inj. into the hind leg. Within five days marked improvement in the X-ray picture was noted. The animal was discharged as cured after one month at the California Veterinary Clinic.—R. N. Fiennes.

Bergman, E. N. & Sellers, A. F. (1960). **Comparison of fasting ketosis in pregnant and nonpregnant guinea pigs.**—Amer. J. Physiol. **198,** 1083-1086. **3350**

A syndrome very similar to pregnancy toxaemia in ewes was obtained by starving g.pigs for 3 days late in pregnancy, with death occurring 1–4 days after cessation of starving. —R.M.

Ford, E. J. H. & Boyd, J. W. (1960). **Some observations on bovine acetonaemia.** — Res. vet. Sci. **1,** 232-241. [Authors' summary modified.] **3351**

Observations are presented on 5 cases of acetonaemia in dairy cattle. Fatty infiltration and depletion of liver glycogen were present at the time of onset of symptoms. Clinical recovery may take place some time before glycogen levels become normal and before the fat is removed.

Although high blood ketones and low blood sugar levels accompany the symptoms, liver changes may persist after clinical recovery, and lactating cows which have shown no symptoms of acetonaemia may have a hyperketonaemia and hypoglycaemia.

In 2 out of 3 cases, high serum glutamic-oxalacetic transaminase levels accompanied clinical symptoms, but serum glutamic-pyruvic transaminase did not change.

Increased serum isocitric dehydrogenase and serum lactic dehydrogenase levels corresponded to the period of elevated blood ketone-body levels rather than to the duration of clinical symptoms. Serum isocitric dehydrogenase also increased in clinically normal lactating cattle with hyperketonaemia but to a lesser extent, whilst serum lactic dehydrogenase did not.

The changes in serum enzyme levels may be a result of increased release from the affected tissues and may be accentuated by increases in cellular enzyme activity.

Kronfeld, D. S., Simesen, M. G. & Dungworth, D. L. (1960). **Liver glycogen in normal and ketotic cows.** — Res. vet. Sci. **1,** 242-247. [Authors' summary modified.] **3352**

Liver samples were taken by biopsy from non-lactating, lactating cows and cows with ketosis. Mean values for glycogen were 3·0±1·1, 1·0±0·86 and 0·26±0·15 g./100 g. wet weight respectively. Stained slides generally showed less glycogen and more fat in cases of ketosis. Possible causes of glycogen depletion and fat mobilization are discussed.

DISEASES, GENERAL

Kazár, G. & Gyimesi, V. (1960). Az 1956-1958. évi vágóhídi statisztika és az abból levonható egyes állategészségügyi következtetések. **[Survey of animal diseases in Hungary during 1956-58, compiled from abattoir statistics.]**—Mag. állator. Lapja **15,** 95-104. [In

Hungarian. Summaries in English and Russian.] 3353

Statistical analysis of data from nearly all the slaughterhouses of Hungary during the years 1956–58 is given and some conclusions are drawn. The percentage of detained and condemned carcasses was 2·85% in 1956, 1·68% in 1957 and 1·31% in 1958. This improvement is attributed to better feeding and husbandry, better lairage and slaughter system and a decline in the incidence of certain diseases. The national average carcass weight of all species had increased by 10–15% during this period, the number of carcasses condemned for emaciation, poor bleeding, septicaemic diseases and decomposition decreased. A marked decline in the incidence of swine fever and swine erysipelas was correlated with the more efficient preventive and control measures. The result of control measures was evident in the decline in incidence of fasciolasis and dicrocoeliasis in cattle, but not in sheep, during this period. Echinococcosis of pigs remained steady, around a 30% incidence, while improved human hygiene and treatment brought about the decline of the incidence of *Cysticercus bovis* from 0·067% to 0·063% and of *C. cellulosae* from 0·003% to 0·002%. At Debrecen, where routine inspection for *Trichinella spiralis* had been adopted in 1957, 4 infected carcasses were found in that year and 2 in the following year. The incidence of bovine tuberculosis was 11·81% in 1956, 11·72% in 1957 and 13·04% in 1958. Because of more efficient detection and notification of cases in the field the number of open and generalized cases found had doubled during the 3 years. The incidence of TB. of pigs varied around 1%. The incidence of most of the diseases mentioned is also analysed according to counties and districts, and figures on the incidence of a number of other diseases are given.—A. Sebesteny.

Hudson, J. R. (1960). **United Nations. Report to the government of Burma, Cambodia, Laos, Thailand and Viet Nam on animal disease control.** pp. 20. Rome: Food & Agriculture Organization of United Nations. (FAO Report No. 1202.) 3354

This report, based on three years' work from July 1956 to December 1959 in Burma, Cambodia, Laos, Thailand and Viet Nam is an excellent source of information on the disease, especially rinderpest, situation in these countries.

As regards Rinderpest, Burma which had been heavily infected during the Second World War is now free from infection, extensive vaccination with goat-adapted virus is being continued especially along the frontiers to the north-west and west. Lapinized virus has also been used for the more susceptible buffaloes in some areas. In Thailand where lapinized vaccine has been prepared in pigs the supply of rabbits has now improved and rabbits are again used routinely. The country is now free from rinderpest and a belt of immunized animals is maintained across the Cambodian frontier.

In Cambodia control of rinderpest has been difficult but progress has been made and in some provinces a high proportion of the cattle and buffaloes have been immunized.

In Viet Nam freeze-dried lapinized vaccine has been widely and methodically used and it is probable that the whole country will soon be free from the disease. Laos seems to be free from rinderpest and the veterinary services are alert and capable of dealing with the disease should it be re-introduced across the land frontiers.

There are valuable comments on the varying susceptibility of cattle and of buffaloes in Asia and on the occurrence of the disease in pigs both wild and domesticated.

Typing of strains of Foot and Mouth Disease virus is now being undertaken at a laboratory at Nong Serai in Thailand.

Swine Fever is present in the area but widespread used of lapinized vaccine is not advised until more is known of the true incidence of the disease.

Considerable success has attended the use of vaccines against Newcastle Disease (F strain of virus) and Fowl Pox (Weybridge strain of virus). Both of these vaccines are suitable for use in day-old chicks.

The Mukteswar vaccine strain of Newcastle disease virus is used in Burma for protection of older birds.

Other diseases which are discussed less fully are Haemorrhagic Septicaemia, Rabies, Brucellosis in pigs and in cattle, Tuberculosis and Leptospirosis in cattle and pigs.

Thoonen, J. & Hoorens, J. (1960). I. Infectieuse en parasitaire zenuwaandoeningen bij het varken. II. Zenuwziekten van niet infectieuse of niet parasitaire aard bij het varken. [**Nervous diseases of pigs.**] — Vlaams diergeneesk. Tijdschr. **29**, 33-45 & 67-86. [In

Flemish. Summaries in English, French and German. Abst. from French summary.] 3355

Infectious diseases of the c.n.s. in pigs in Belgium are reviewed. Rabies and Teschen disease do not occur; chronic swine fever is common; Aujeszky's disease was diagnosed about 10 times in the last 2 years. Suppurative lesions of the c.n.s. associated with polyarthritis and polyserositis are common and tuberculous meningitis (associated with TB. mastoiditis) was observed in 2 pigs. Listeriosis, toxoplasmosis and leptospirosis with involvement of the c.n.s. have not been reported although about 10% of the pigs are serologically positive for leptospirosis.

Non-infectious diseases of the c.n.s. in pigs are reviewed in Part II and accounts are given of hydrocele, hydrocephalus and congenital blindness (probably hereditary). Trembling in piglets occurs in 2 forms: hereditary (St. Vitus' dance) with sporadic incidence and low mortality; myoclonia congenita following intra-uterine swine fever infection, which is endemic and causes high mortality. An account is given of paroxysmal trembling affecting pigs aged 15 weeks and lasting until slaughter. Nervous disorders due to vitamin deficiency are uncommon, stiffness and asthenia being mainly due to muscular and skeletal lesions. Convulsions were common in young piglets, due to injection of highly concentrated sulphonamides.

—T.E.G.R.

Priestley, F. W. (1960). **United Nations. Report to the government of the Federation of Malaya on animal health problems with special reference to Johne's disease in oxen and pericarditis in buffaloes.** pp. 25. Rome: Food & Agriculture Organization of United Nations. (FAO Report No. 1196). 3356

Investigations in Malaya indicated that Johne's disease is present amongst cattle at the Paroi and Kluang Animal Husbandry Stations, but as yet does not appear to have spread by distributed stud bulls to local stock. Little evidence was found that the disease is endemic, only 6 of 144 emaciated cattle being positive to the complement-fixation test; only 2 of 279 were excreting *M. johnei* in faeces. It seems probable that the anaemia-emaciation syndrome ("R" disease) of local cattle is not connected with Johne's disease, but is an anaemia caused by blood parasites and possibly trace element imbalance complicated by malnutrition, helminth infestations and protein deficiency in fodder grasses. Recently a chronic fatal fibrinous pericarditis has occurred in Malayan and crossbred buffaloes. It appears to be caused by a streptococcus and may be associated with trauma due to thorns in the fodder. Recommendations are made concerning these problems and an account given of some experimental work undertaken with a view to improving the present methods of diagnosing Johne's disease.

—A. Ackroyd.

Cockrill, W. Ross. (1960). **Pathology of the cetacea. A veterinary study on whales—Parts I & II.**—Brit. vet. J. **116,** 133-144 & 175-190. [Author's discussion and summary modified.] 3357

A review is given of the aetiology, course, and effect of disease conditions found in Baleen and Sperm whales in the Weddell Sea and Ross Sea areas during two Antarctic pelagic whaling seasons.

In view of the importance of the whaling industry in adding to world food stocks for man and animals the public health aspect is stressed.

Parasitic infestations of the Antarctic whales are considered, and the author's collections of internal and external parasites are described in relation to the lesions produced. Two new host records, and one species of cestode not previously described, were recorded.

Tumours were benign and frequently retrogressive. The numerous specimens observed are described.

The formation of abscesses in muscle and other tissues and their probable aetiology is discussed.

Details are given of other lesions. Ready and abundant formation of fibrous tissue and calcification is considered to be a characteristic response of the whale to injury or irritation.

The traumatic lesions commonly found in whales are enumerated and reference is made to the sequelae of traumata, including caries and dental absorption in the teeth of Sperm whales.

Bacterial conditions of whale tissues were comparatively rare. The nature of the whale's environment in relation to this is discussed. The possibility of the existence of other diseases, not so far recorded, is discussed.

Some abnormalities and malformations of the foetus were found and multiple pregnancy has been recorded.

The paper is illustrated by numerous photographs, and has a bibliography of over 200 references.

Lannek, N., Persson, F., Obel, A.-L., Sevelius, F., Sten, G. & Vigre, E. (1960). Grässjuka på Jägersro. **[Grass sickness at Jägersro racecourse.]** — Medlemsbl. Sverig. VetFörb. **12,** 106-110 & 113. [In Swedish.] **3358**

Between September and December 1959, seven stall-fed horses in two stables died from acute or peracute grass sickness. Linseed poisoning was suspected, but was excluded by experiment. The authors discussed the literature (17 refs.).—F.E.W.

Gambino, U. (1959). La misurazione del tempo di protrombina in bovini affetti da alcune epatopatie. **[Prothrombin time in cattle with liver disease.]**—Atti Soc. ital. Sci. vet. **13,** 638-642. [Summaries in English and French.] **3359**

Prothrombin time in 60 normal calves and cattle varied from 11 to 19 sec. In normal adults it varied from 13 to 19 and averaged 14 sec. In 22 cattle with severe liver lesions (liver fluke and/or echinococcus) it varied from 13 to 22 with an average of 17 sec. Cattle with moderate liver lesions had values within the normal range.—R.M.

Provost, A. (1960). **Clinical studies on "abu nini".**—Vet. Rec. **72,** 353. **3360**

The aetiology of "abu nini," a contagious disease of goats and sheep, is not as clear-cut as is suggested in Otte's paper [*V.B.* **30,** 2152] on the disease in the Sudan. Work in Chad has shown that similar lesions may be present in caprine pleuropneumonia or in heartwater. Abu nini is probably not a single entity but rather a syndrome possibly initiated by stress. —A. Ackroyd.

Buechner, H. K. (1960). **The bighorn sheep in the United States, its past, present and future.** — Wildlife Monographs No. 4 pp. 174. **3361**

Diseases of *Ovis canadensis* are dealt with in a 45-page chapter on natural mortality. Special attention is paid to pneumonia provoked by *Protostrongylus stilesi* and *P. rushi,* which has caused heavy losses.—R.M.

van Nie, C. J. (1960). Hyperthermie bij biggen in de markthal te Meppel. **[Hyperthermia in piglets in the market hall at Meppel.]** — Tijdschr. Diergeneesk. **85,** 285-288. [In Dutch. Summary in English.] **3362**

During summer 1959, 7 piglets died among 26,500 passing through the market. Three died from hyperthermia probably as a result of fighting. The other 4 had hyperthermia and parasitic hepatitis. There were 2 losses among 1,002 store pigs, attributed to over-feeding, and no losses among 1,373 adult pigs in the market. An allegation of poor ventilation in the hall was rejected. Transport to the market in lorries may have contributed to the deaths.—R.M.

Cantoni, O., Molinari, P. & Tradati, F. (1959). Osservazioni sul comportamento della aldolasi nelle dermatosi estive del cane. **[Aldolase activity in the blood of dogs with summer skin diseases.]**—Atti Soc. ital. Sci. vet. **13,** 642-645. [Summaries in English and French.] **3363**

Aldolase activity in blood from 17 dogs with diffuse erythema or localised eczema was about twice the normal activity. The method used was that of M. M. Friedman & B. Lapan (1958).—R.M.

Gärtner, K. (1960). Funktionsstörungen der Niere beim nephritis-kranken Hund. **[Kidney function in dogs with nephritis.]**—Kleintier-Praxis **5,** 55-58. **3364**

G. estimated the renal clearance of para-aminohippuric acid, inulin and urea in 20 cases.—R.M.

Gross, P., Westrick, M. L. & McNerney, J. M. (1960). **A connective tissue disease with pulmonary fibrosis in guinea pigs.**—Arch. Path. **69,** 130-138. [Authors' summary modified.] **3365**

In a disease of connective tissues found in 14 g.pigs interstitial pulmonary fibrosis with degeneration of elastic tissue was the most prominent feature. Other lesions included calcific degeneration of the aorta with aneurysmal dilatation and calcification, and other lesions of the heart.

These affected 14 g.pigs among a total of 281 which either inhaled or were given injections of one of a number of diverse dusts. None of the latter is known to be capable by itself of producing the lesions described.

Although not proved, the probability points to a common factor in the experimental technique used as the aetiological agent, in that all the dusts used were found to be contaminated with iron. No evidence of this disease was found in 122 controls.

Urist, M. R. & Deutsch, N. M. (1960). **Influence of ACTH upon avian species and osteoporosis.**—Proc. Soc. exp. Biol., N.Y. **104,** 35-39. [Authors' summary modified.] **3366**

Osteoporosis, occurring spontaneously in White Leghorn hens, was aggravated by injections of mammalian adrenocorticotrophic

hormone; the disorder did not develop in the male. It is suggested that there may be a causal relationship between ACTH, osteoporosis and the modern poultry disorder known as "Cage Layer Fatigue."

Urist, M. R. & Deutsch, N. M. (1960). **Effects of cortisone upon blood, adrenal cortex, gonads, and the development of osteoporosis in birds.** — Endocrinology **66,** 805-818. [Authors' abst. modified.] **3367**

Domestic birds tolerated massive doses of cortisone and developed osteoporosis that was very slight in cocks, moderately severe in capons, and severely destructive in hens. After four weeks of treatment, the adrenals and gonads were atrophied, and there was hypercalcaemia, with an elevation in the ultrafilterable fraction of serum Ca. Egg production generally ceased within one week, but a few birds continued to lay irregularly, or briefly, shell-less dwarf eggs with a membranous stalk. Bone was resorbed from the endosteal surface of the cortex, a local mechanism that did not require formation of osteoclasts. Oestrogen, without androgen, did not give the hen protection against osteoporosis. Cocks were relatively resistant to osteoporosis.

Kowalewski, K. (1960). **Lipid pattern in serum, liver and aorta of turkeys fed diets added with beta-aminopropionitrile and cholesterol.** — Arch. int. Pharmacodyn. **126,** 56-62. **3368**

Although beta-aminopropionitrile (BAPN) provoked dissecting aneurysms in turkeys, it had no effect on lipids in serum, liver or aorta. Addition of cholesterol to the diet altered the lipid pattern but did not alter lesions caused by BAPN.—R.M.

Löliger, H. C. (1960). Die Pathomorphologie des Bindegewebes beim Huhn. **[Pathology of connective tissue in fowls.]** — Arch. exp. VetMed. **14,** 354-379 & 381-451. **3369**

This detailed study is accompanied by 52 photomicrographs. The author's aim was to describe the types of pathological change that occur in connective tissue, to discuss their cause, and to compare similar changes in mammals. The paper is divided into two parts: classification and derivation of connective tissue, and pathology. The latter deals with hyperaemia and oedema, inflammation, reticulosis, haemoblastoses, and reticulosarcoma.

Only some of the findings are noted here: the physiological hyperplasia of lymphoreticular tissue that occurs in a response to high production can cause various complications, such as closure by pressure of capillary vessels. The fowl differed from mammals in the intense proliferative reaction of connective-tissue cells within organs. Hyperplasia of reticular cells, particularly histiocytes and monocytes, was common but fibrocytic collagenous scar formation was rare.—R.M.

Andersen, A. C. & Shultz, F. T. (1960). **Effect of whole-body irradiation on the estrous cycle and fertility of beagles.**—Radiation Res. **12,** 417-418. **3370**

292 female beagles exposed to 100 r or 300 r X-rays at puberty were of normal fertility until 4 years of age, when irregularities of the oestrous cycle such as polyoestrus or prolonged anoestrus appeared in those that had received 300 r. Beagles surviving a median lethal dose of fast neutrons were fertile, but unable to whelp or lactate.—M.G.G.

Rehfeld, C. E., Stover, B. J., Taylor, G. N., Atherton, D. R. & Schneebeli, G. (1960). **Eye changes in beagles following intravenous injection of radium^{226}.**—J. Amer. vet. med. Ass. **136,** 562-564. [Authors' summary modified.] **3371**

Marked changes in the pigmented parts of the eyes of beagles have been observed within one year after injection of radium^{226}. Since the degree of alteration was greater both for longer intervals and for higher doses, the changes apparently resulted from the radium. Presumptive evidence of a direct radiation effect was obtained: analyses showed radium^{226} concentration in eyes to be greater than that in plasma, and greater in pigmented than in non-pigmented parts of eyes.

Ashikawa, J. K. (1960). **Postirradiation protection of mice with lipids.**—Radiation Res. **12,** 418. **3372**

Olive oil had a protective effect on mice against X-rays if given i/p within an hour after irradiation. The effect appeared to be due to stimulation of the reticulo-endothelial system and was suppressed by increasing the stearate content of the oil. Some protection was given by methyl oleate.—M.G.G.

Mraz, F. R. & Bacon, J. A. (1960). **Influence of excessive amounts of vit.D$_3$ on strontium-89 metabolism in the rat.**—Proc. Soc. exp. Biol., N.Y. **104,** 1-3. **3373**

The vitamin increased absorption of radiostrontium from the gut and increased urinary excretion.—R.M.

Kobayashi, H. & Gorbman, A. (1960). **Radio-iodine utilization in the chick.**—Endocrinology **66,** 795-804. [Authors' abst. modified.] 3374

Great variability of quantity of radio-iodine accumulated by the chick thyroid at different seasons was confirmed. The level of additional administered iodine did not appreciably affect this variability. Thyrotrophic hormone increased the absolute thyroid uptake of I^{131}; additionally administered iodine and thiouracil depressed it.

Labelled mono-, di-, and tri-iodothyronine, and thyroxine, were found in normal chicks. Their proportions were altered by the various experimental conditions and by season alone. Thyrotrophin favoured thyroxine production. Thiouracil appeared to block hormone synthesis at the mono-iodotyrosine stage.

Yasukawa, M. & Nagano, K. (1960). **Influence of tantalum on the plasma proteins in fowls.** —Jap. J. vet. Sci. **22,** 135-141. [In Japanese. English summary modified.] 3375

Potassium tantalate was administered to 4 cocks subcutaneously in doses of 0·05 to 1·5 μc per g. body wt., and the plasma proteins were analysed by electrophoresis.

After administration of Ta^{182}, the albumin decreased. The characteristic electrophoretic patterns, showing the peak of albumin lower than that of globulin, were often obtained after injection of 0·5 to 1·5 μc/g. As the result of the administration of Ta^{182}, the numbers of red and white cells increased. Liver and lung contained the highest radioactivity, followed by the kidney, spleen, testicle and bone marrow.

McGill, H. C., Strong, J. P., Holman, R. L. & Werthessen, N. T. (1960). **Arterial lesions in the Kenya baboon.** — Circulation Res. **8,** 670-679. 3376

The authors examined 163 *Papio doguera.* Three-quarters of adults had lipid deposits in the aortic intima. These cannot be attributed to excessive consumption of animal fat or to excess cholesterol in the blood.—R.M.

Vogel, F. S. (1960). **Nephrotoxic properties of copper under experimental conditions in mice with special reference to the pathogenesis of the renal alterations in Wilson's disease.** —Amer. J. Path. **36,** 699-711. [Author's summary modified.] 3377

When ionized copper was injected intraperitoneally into mice as a copper-albumin complex, it promptly entered the glomerular filtrate and was taken into the cytoplasm of the renal tubular epithelium. Marked necrosis of the proximal convoluted tubular epithelium occurred when concentrations of copper were present that approximated those frequently found in the kidneys of patients with hepatolenticular degeneration. Some animals died while in others epithelial regeneration occurred promptly, with residual epithelial hyperplasia and calcification. Copper itself may be an important factor in the pathogenesis of the renal abnormalities of Wilson's disease (hepato-lenticular degeneration).

POISONS AND POISONING

Boddie, G. F. (1960). **"Fluorine alleviators" III. Field trials involving cattle.**—Vet. Rec. **72,** 441-445. [Author's summary modified.] 3378

Trials with fluorine alleviators were made on 20 cattle grazing for 3 years on an area heavily contaminated with fluorine compounds from an industrial undertaking. Ten of the cattle were kept as controls and 10 received the fluorine-alleviator, a mixture of calcium carbonate and aluminium oxide.

During the trial herbage was analysed for fluorine content; the principal factor responsible for fluctuations in herbage contamination was variation in the factory load.

While it had some efficacy as an alleviator calcium aluminate fell short of being a completely effective antidote.

The difficulties inherent in the translation of results of experimental trials in rats to cattle under natural grazing conditions are described and discussed.

The complete solution of the problem of industrial fluorosis in farm livestock must depend upon the reduction of the discharge of fluorine compounds into the atmosphere.

Maplesden, D. C., Motzok, I., Oliver, W. T. & Branion, H. D. (1960). **Placental transfer of fluorine to the fetus in rats and rabbits.**— J. Nutr. **71,** 70-76. 3379

The placentas of rats and rabbits were an extremely efficient barrier to the passage of fluorine.—R.M.

Worker, N. A. (1960). **A hepatotoxin causing liver damage in facial eczema of sheep.** — Nature, Lond. **185,** 909-910. 3380

Macroscopic lesions consistent with those associated with facial eczema were observed in the liver of rabbits after injection of the toxic principle of *Sporidesmium bakeri* into the portal vein. The extent and severity of the lesions were confirmed histologically. Injection of toxic material into the jugular vein did not cause gross liver lesions. This suggests that, after absorption from the intestine, the toxic agent enters the liver mainly by the portal circulation. There is evidence that the toxic agent is relatively unstable in the systemic circulation and is taken up by the liver cells on its first passing through the liver sinusoids. The toxic agent was demonstrable in bile half an hour after intraportal injection and maximal output occurred within 2 hours. The importance of these findings is discussed.—T.E.G.R.

Russell, G. R. (1960). **Detection and estimation of a facial eczema toxin, sporidesmin.**— Nature, Lond. **186,** 788-789. 3381

R. described chromatography and titration methods using as reagent a soln. of iodine and sodium azide.—R.M.

Smit, J. D. (1959). Die histopatologiese diagnose van gousiekte. **[Histopathological diagnosis of "gousiekte".]**—J. S. Afr. vet. med. Ass. **30,** 447-450. [In Afrikaans. English summary modified.] 3382

A brief review of the "gousiekte" literature is given, with mention of the various plants that have been incriminated and a comparative description of the histology of the lesions.

The pathogenesis of the heart failure is discussed, and the conclusion drawn that dilatation of the heart is not the explanation. S. emphasized the constant occurrence of focal lesions in the apex of the heart and the importance of this portion of the heart in the histological diagnosis of the disease. He postulated that the focal myocarditis in the apex is responsible for acute heart block resulting in acute fibrillation and heart failure.

Poulsen, E. (1960). Sulfadimidinforgiftning hos smågrise. **[Sulphadimidine poisoning in piglets.]**—Medlemsbl. danske Dyrlaegeforen. **43,** 112-114. [In Danish.] 3383

P. described two typical incidents, in which 11 of 18 unweaned piglets, 6 and 8 days old, died as a result of overdosage with a concentrated solution of sulphadimidine injected parenterally and several others had to be killed when moribund. Chemical analysis of blood, liver and kidney revealed the sulphonamide in concentrations varying from 37 to 111, 53·4 to 160·8 and 52 to 160 mg. per 100 g. respectively: these concentrations agreed well with those found in piglets by Dalgaard-Mikkelsen *et. al.* [*V.B.* **24,** 2061] after i/p inj. of 800 mg./kg. sulphadimidine, which caused clonic cramps increasing in intensity until the piglets were moribund and were destroyed. These incidents and the experiments quoted show that, in piglets weighing about 1 kg., parenteral inj. of 750–1000 mg. sulphadimidine (3–4 ml. 25% soln.) may cause fatal poisoning.—F.E.W.

Venturoli, M. & Tunioli, L. (1959). Determinazione della colinesterasi ematica in bovini normali ed in bovini sottoposti ad avvelenamento con parathion. **[Blood cholinesterase in parathion poisoning in cattle.]**—Atti Soc. ital. Sci. vet. **13,** 545-549. [Summaries in English and French.] 3384

Four calves 4–9 months old were poisoned by daily oral administration of 2 mg./kg. for 9–13 days. On subsequent occasions they were given 5, 10 and 20 mg./kg. Normal cholinesterase values for erythrocytes from 51 calves ranged from 55–78% (*i.e.*, hydrolysis of 0·55–0·78 mg. of acetylcholine chloride). Values well below 50% were obtained in the calves given 5 mg./kg. or more. In calves given 2 mg./kg. the values fell to 50% but promptly returned to normal when administration stopped.—R.M.

Radeleff, R. D., Nickerson, W. J. & Wells, R. W. (1960). **Acute toxic effects upon livestock and meat and milk residues of dieldrin.** —J. econ. Ent. **53,** 425-429. [Authors' abst. modified.] 3385

Dieldrin poisoned young calves when applied dermally at 0·25%, young lambs at 3%, cattle at 2% and sheep and goats at 4%; lower concentrations were not toxic. Higher concentrations were toxic in all cases. Horses tolerated 1% sprays.

When orally administered, dieldrin poisoned young calves at 10 mg./kg., young pigs at 50, sheep at 25 and horses at 25 mg./kg.; lower doses were not toxic.

All treatments, single and multiple, left residues in meat or milk. Fat analysis showed 8 to 146 p.p.m. following treatment; milk showed 4·9 to 8·3 p.p.m. following 0·5% sprays.

Residues declined slowly, 16 to 24 weeks being required for fat to reach less than 1 p.p.m., 3 weeks for milk to return to less than 0·2 p.p.m.

Gannon, N. & Decker, G. C. (1960). **The excretion of dieldrin, DDT, and heptachlor epoxide in milk of dairy cows fed on pastures treated with dieldrin, DDT, and heptachlor.** —J. econ. Ent. **53**, 411-415. [Authors' abst. modified.] 3386

To determine the degree of milk contamination that might be expected when dairy cows were permitted to graze on an insecticide-treated pasture, tests were initiated using dieldrin, DDT, and heptachlor applied at about twice the normal rate (0·5, 3 and 0·5 lb. per acre respectively). When cows were permitted access to pastures immediately after treatment, the chemicals reached their maximum concentrations in the milk within 3 to 7 days (dieldrin 3 to 4 p.p.m.; DDT 7 to 8 p.p.m.; heptachlor as heptachlor epoxide 0·22 p.p.m.) and declined steadily thereafter.

See also abst. 3448 (book, biological control of insects and weeds in Australia and New Guinea).

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

Campbell, I. R. & Widner, E. M. (1958). **Annotated bibliography: the occurrence and biological effects of fluorine compounds. Volume 1. The inorganic compounds. Books I & II.** Book I pp. ii+507 & Book II pp. 509-955. Cincinnati, Ohio: Kettering Laboratory, University of Cincinnati. 3387

This carefully composed collection of 8,700 abstracts covers the period 1800–1957. The abstracts are arranged under 16 headings which cover every aspect of the action and uses of inorganic fluorine compounds. References to the physiology and toxicology of fluorine in animals occur in chapter 4: "Observations on warm-blooded animals (except man)", and chapter 7: "Problems associated with pollution of air and water." References to sodium fluoride as an anthelmintic occur in chapter 10; "Uses in therapy."

Coverage of the veterinary literature was checked by reference to articles appearing in 1954/56, and was found to be remarkably complete. A few omissions were Dale & Crampton (1955) on fluorosis in cattle; Lebduska & others (1955) on sodium fluosilicate for ascarids in pigs; Ruder (1956) on the fleece of sheep receiving NaF; Akramovski and others (1956) on sodium fluosilicate for ascarids in horses.

Author and subject indexes, and the arrangement of the abstracts combine to make it easy to locate references.—R.M.

Paul, M. F., Paul, H. E., Bender, R. C., Kopko, F., Harrington, C. M., Ells, V. R. & Buzard, J. A. (1960). **Studies on the distribution and excretion of certain nitrofurans.** —Antibiot. & Chemother. **10**, 287-302. 3388

Nitrofurazone, furazolidone, nitrofurantoin and 13 other nitrofurans were given by mouth or by i/v inj. to lab. animals, cows, pigs, dogs and fowls and the following properties were measured: concentration in blood and tissues; excretion in faeces, urine, bile, milk, and cerebrospinal fluid; binding to plasma proteins. Cows given 20 mg./kg. furaltadone hydrochloride i/v excreted 4–6 mg. in a litre of milk 4 hours after injection, while sows given the same dosage by mouth excreted 6–4 mg./litre after 4 hours. Nitrofurans administered continuously in food or drinking water for 2–4 weeks to calves, sheep, pigs and fowls did not accumulate in the tissues. For detailed results the reader must consult the original paper.—R.M.

Kendrick, J. W. & Pier, A. C. (1960). **Antibiotic levels in milk following intrauterine infusion.**—Calif. Vet. **13**, No. 5 pp. 27-28. [Authors' summary.] 3389

Penicillin, dihydrostreptomycin and oxytetracycline were used in the doses and manner commonly employed for the treatment of endometritis. These antibiotics were not detected in the milk following treatment and therefore, it is unnecessary to withhold from human consumption milk from cows treated in this manner.

Walshe, J. M. (1960). **Treatment of Wilson's disease with penicillamine.**—Lancet, January 23rd, 188-192. 3390

A summary of 22 cases of Wilson's disease (hepato-lenticular degeneration) treated with penicillamine ($\beta\beta$ dimethyl cysteine), of which 16 were also treated with dimercaprol. In 11 cases there was a good but limited response, and 6 others became symptom-free. The nature of the therapeutic activity of penicillamine is still unknown.

—W. E. Parish.

Frenkel, J. K. (1960). **Evaluation of infection-enhancing activity of modified corticoids.**—Proc. Soc. exp. Biol., N.Y. **103**, 552-555. [Author's summary modified.] **3391**

Chronic latent *Globidium (besnoiti)* infection in hamsters is highly sensitive to corticoid effects. Fatal relapse from renewed proliferation of the organisms can be brought about as early as 6 days after initiation of corticoid therapy. Potency ratios were determined for 22 modified progestins and corticoids by assay using as end-point the dose producing relapse on the 12th day.

Tavernor, W. D. (1960). **The effect of succinylcholine chloride on the heart of the horse: clinical and pathological aspects.**—Vet. Rec. **72**, 569-572. [Author's summary modified.] **3392**

An account is given of observations made on 52 horses that were cast with intravenous suxamethonium chloride. Thirty-nine were clinical cases and of these 24 were sedated prior to casting. Examinations were made of the hearts of 13 horses that were killed after casting. The hearts of 30 horses which did not receive the relaxant were examined as controls. T. confirmed that the drug should not be used on horses with heart disease.

Kinard, R. & McPherson, C. W. (1960). **The use of trichloroethylene and halothane anaesthesia in the restraint of laboratory primates.** —Amer. J. vet. Res. **21**, 385-388. [Authors' summary modified.] **3393**

Trichloroethylene vapour, 3·2 to 4·2%, and halothane vapour, 3·2%, in air, were administered to monkeys and chimpanzees in a transparent chamber. This effective and safe means of temporary restraint has been adopted for routine use.

Szeligowski, E. & Zembrzycka, H. (1960). Badania nad wartością metody dopłucnego podawania barbituratów (ewipal, eunarkon) u psów. **[Intrapulmonary administration of barbiturate anaesthetics in dogs.]** — Med. Wet. Warszawa **16**, 209-218. [In Polish. Summaries in English, French, German and Russian.] **3394**

51 dogs were used and good results were obtained with 10% barbiturate solution injected through the 7th and 8th intercostal space. Larger doses of barbiturates (over 40 mg./kg. body wt.) than generally accepted could be used and were often followed by a post-narcotic sleep lasting several hours. The resulting inflammatory changes in the lung were confined to an area of about 2 × 12 mm. and after 10 to 12 days healed with the production of a small scar. The authors consider this type of anaesthesia suitable for healthy dogs which are difficult to restrain for an i/v injection.—M. Gitter.

Weiser, H. & Soliman, M. K. (1960). Erfahrungen mit Thiogenal als Kurznarkotikum bei der Ratte. **[Thiogenal (methitural) as a short-acting anaesthetic for rats.]** — Zbl. VetMed. **7**, 519-523. [Summaries in English, French and Spanish.] **3395**

Methitural gave satisfactory surgical anaesthesia lasting 20–30 min. when injected i/p at 12 mg./100 g. body wt.—R.M.

See also absts. **3153** (K. pneumoniae infection); **3159** (nitrofurazone in salmonellosis); **3191** (griseofulvin); **3205** (aminonitrothiazole in avian trichomoniasis); **3207** (coccidiosis); **3210** (experimental babesiasis); **3217** (pyrimethamine and sulphadiazine in toxoplasmosis); **3240** (chemotherapy of smallpox); **3241** (interferon); **3299, 3301-3304** (parasiticides); **3308** (molluscicides); **3311, 3314, 3322, 3324, 3327, 3329-3330 & 3333** (anthelmintics); **3383** (sulphadimidine poisoning in piglets); **3384** (parathion poisoning in cattle); **3385** (toxicity of dieldrin); **3386** (excretion of parasiticides in milk of cows on treated pastures); **3450** (British national formulary).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Blackwood, U. B. & Pollard, W. O. (1960). **Growth inhibition and leg disorder in chicks following parenteral administration of hemin and non-metalloporphyrins.**—Proc. Soc. exp. Biol., N.Y. **103**, 556-559. [Authors' summary modified.] **3396**

In this study on 2-day old chicks the reversing effects of haemin on 2-ethyl-5-methylbenzimidazole (EMB) and growth depression and leg deformity produced by haemin and certain non-metalloporphyrins were investigated. Haemin did not reverse the growth-depressing action of EMB. Haemin and porphyrins depressed growth below that of controls; also, haemin and protoporphyrin caused bowing of legs. That the basic porphyrin nucleus and not iron imbalance is the probable cause of this depression and leg bowing is demonstrated by similarity of action of protoporphyrin and haemin. Haematoporphyrin depressed growth but did not produce leg bowing. Incidence of bowing was directly related to dose.

Pruitt, R. D. & Essex, H. E. (1960). **Potential changes attending the excitation process in**

the atrioventricular conduction system of bovine and canine hearts.—Circulation Res. **8**, 149-174. 3397

Measurements were made by electrocardiography, using needle electrodes inserted into the exposed heart of anaesthetized animals. There are illustrations and photomicrographs of the conduction system in calves.—R.M.

Stowe, C. M. & Good, A. L. (1960). **Estimation of cardiac output in calves and sheep by the dye and Fick oxygen techniques.**—Amer. J. Physiol. **198**, 987-990. 3398

A method for aortic puncture was developed in order to obtain arterial blood. In 15 unanaesthetized calves average cardiac output was 123 ml./kg./min. while in anaesthetized calves and ewes average figures of 118 and 126 were obtained. There was close agreement between the two methods used.—R.M.

Doyle, J. T., Patterson, J. L., Warren, J. V. & Detweiler, D. K. (1960). **Observations on the circulation of domestic cattle.**—Circulation Res. **8**, 4-15. 3399

Intravascular and intracardiac pressures were recorded in 12 cows. Cardiac output and related functions were measured and were related to body size. Effects of environmental stimuli and lowing were studied. Differences between man, cow and giraffe were discussed. —R.M.

Bollwahn, W. (1960). Die Senkungsgeschwindigkeit der Erythrozyten beim Schwein. **[Erythrocyte sedimentation rate in pigs.]**—Dtsch. tierärztl. Wschr. **67**, 378-380. [Summary in English.] 3400

Data are given for sedimentation at 10, 30, 60, 120 min. and 24 hours in obliquely-held tubes, of blood from 70 store pigs, 61 weaned piglets and 41 unweaned piglets. Averages for these groups at 10 min. were 6, 8 and 7 mm. while the 24-hour values were 112, 122 and 130 mm.—R.M.

Cohn, Z. A. & Morse, S. I. (1960). **Functional and metabolic properties of polymorphonuclear leucocytes. I. Observations on the requirements and consequences of particle ingestion. II. The influence of a lipopolysaccharide endotoxin.**—J. exp. Med. **111**, 667-687 & 689-704. [Authors' summary modified.] 3401

I. The phagocytosis and intracellular destruction of bacteria by rabbit polymorphonuclear leucocytes has been studied *in vitro* under defined conditions.

The efficient and continuing ingestion of bacteria was dependent upon (a) opsonic factors in fresh rabbit serum, (b) the availability of an adequate supply of glucose in the medium.

Leucocytes which were ingesting heat-killed bacteria exhibited increases in oxygen consumption, glucose utilization, and lactic acid synthesis. Leucocytes which had previously ingested heat-killed bacteria also demonstrated increased rates of phagocytosis.

II. The effects of a purified bacterial lipopolysaccharide endotoxin on rabbit polymorphonuclear leucocytes were studied. Using a concentration ranging from 0·1 to 50 μg./ml., it was shown that endotoxin enhanced the rate at which staphylococci were killed by leucocytes.

Similar concentrations of endotoxin increased the utilization of glucose and the production of lactic acid. Endotoxin-treated leucocytes exhibited no change in oxygen consumption, and only a slight depression in glycogen synthesis.

It appeared that endotoxin could interact and alter the functional and metabolic properties of leucocytes in the absence of serum.

van der Horst, C. J. G. (1960). Bepaling van mangaan in bloedserum van runderen. **[Determination of manganese in the blood of cattle.]**—Tijdschr. Diergeneesk. **85**, 633-638. [In Dutch. Summaries in English, French and German.] 3402

The method of Gates & Ellis (1947) was applied to serum from 9 pregnant cows, 9 calves, 9 calves with "straight hocks" and 9 horses. No striking differences were found between each group. Values in cattle ranged from 10 to 28 μg./100 ml.—R.M.

Alexander, F. & Moodie, E. W. (1960). **The recording of rumen movements in the intact cow, and the effect of certain drugs.**—Res. vet. Sci. **1**, 248-254. 3403

The apparatus consisted of a rubber balloon strapped to the left flank and connected to a manometer. It was used successfully on 14 out of 15 cows. Rumen movements were inhibited by hyoscine and usually by carbachol. Eserine and posterior pituitary extract had no effect.—R.M.

Benirschke, K. & Bloch, E. (1960). **Failure to demonstrate C19-steroids in bovine testis.** —Acta endocr., Copenhagen **34**, 65-68. 3404

It proved impossible to demonstrate the presence of ketosteroids in testicles from 100 calf foetuses.—R.M.

Crawford, J. D. & McCance, R. A. (1960). **Sodium transport by the chorioallantoic membrane of the pig.**—J. Physiol. **151,** 458-471. [Authors' summary modified.] 3405

The passage of water and several electrolytes across the isolated allantoic epithelium and the bi-epithelial chorioallantoic membrane was studied. The allantoic epithelium was freely permeable to sodium, chloride and water and was electrically neutral.

The full thickness of the chorioallantoic membrane gave rise to an electrical potential with the maternal surface positively charged relative to the foetal side. At short-circuit, current flow appeared to be equivalent to net sodium flux across the membrane.

Short-circuit current and potential increased with the stage of gestation and temperature, and decreased with a fall in pH, rise in CO_2 tension and deprivation of oxygen. No short-circuit current or potential was measurable when Na conc. on the foetal side was reduced to less than 0·3 m-equiv/litre. Electrical activity was reduced in the presence of natural allantoic fluid on the foetal side and by both very low and very high potassium conc. in the fluid bathing the maternal side. Neither electrical activity nor the passage of water across the membrane was influenced by vasopressin, acetazoleamide or chlorothiazide.

I. McCance, R. A. & Stanier, M. W. (1960). **The function of the metanephros of foetal rabbits and pigs.** — J. Physiol. **151,** 479-483. 3406

II. McCance, R. A. & Widdowson, E. M. (1960). **The acid-base relationships of the foetal fluids of the pig.** — Ibid. 484-490. [Authors' summaries modified.] 3407

I. Blood serum, allantoic fluid and bladder fluid were taken from foetal rabbits and pigs at two stages of gestation after the development of the metanephros. The concentration of chloride and urea and the tonicity of these three fluids were measured.

In rabbit foetuses at both stages the conc. of urea in bladder fluid was higher, and that of chloride lower, than in the serum.

In pig foetuses at both stages the conc. of chloride in the bladder fluid was much lower than that in the serum; and the conc. of urea was higher.

Allantoic fluids of both species varied considerably in composition but differed always in some respects from fluids taken from the bladder. Such allantoic fluid as was still present at the later stage of gestation in the pig contained a high conc. of urea, and a higher mean tonicity and mean chloride level than at 67 days.

II. The allantoic and other fluids, together with certain tissues and membranes of the foetal pig, were examined at 22, 46, 67 and 90 days gestation. By 46 days the pH of the allantoic fluid was about 6·0. The fluid contained ammonium ions and the acidity was largely due to carbonic acid.

The chorioallantoic membrane, the amniotic membrane, the foetal mesonephros, metanephros and stomach all contained active carbonic anhydrase. There was measurable activity in the allantoic fluid.

The conc. of K, Ca, chloride, inorganic sulphate and creatinine in the allantoic fluid rose to a considerable height at 90 days, when the functional life of the sac was nearly over, but the conc. of Na continued to fall.

Freinkel, N. (1960). **Further observations concerning the action of pituitary thyrotropin on the intermediate metabolism of sheep thyroid tissue in vitro.**—Endocrinology **66,** 851-859. [Author's abst. modified.] 3408

Pituitary thyrotropin (TSH) augments the assimilation of glucose by sheep thyroid slices and promotes lipogenesis from, and oxidative decarboxylation of, glucose-U-C^{14}. TSH also enhances the incorporation of inositol-C^{14} into thyroid lipids even in glucose-free media. The observations support the thesis that TSH directly affects the intermediate metabolism of thyroid tissue. Although the metabolic effects of TSH do not require exogenous substrate for initiation, the alterations in assimilative capacities may facilitate sustained TSH action upon thyroid function and growth.

Davidson, J. M., Contopoulus, A. N. & Ganong, W. F. (1960). **Trophic hormone content of the anterior lobe of the pituitary gland in normal and castrate male dogs.**—Acta endocr., Copenhagen **34,** 169-175. 3409

Castration had no effect on the content of growth hormone in the pituitary, but it resulted in a sixteen-fold increase in follicle-stimulating hormone and it doubled the interstitial-cell stimulating hormone content. —R.M.

Munsick, R. A., Sawyer, W. H. & van Dyke, H. B. (1960). **Avian neurohypophysial hor-**

mones: pharmacological properties and tentative identification. — Endocrinology **66,** 860-871. [Abst. from authors' abst.] **3410**

Pharmacological, paper chromatographic and enzymic studies furnish evidence that oxytocin and arginine vasotocin may be neurohypophyseal hormones in the chicken.

Yasuda, M. (1960). **Comparative and topographical anatomy of the fowl. III. Nerves of the thoracic limb.**—Jap. J. vet. Res. **22,** 89-101. [In Japanese. Summary in English.] **3411**

The nerves and the muscles supplied by them are listed in the English summary. There are five plates of illustrations.—R.M.

Lawson, D. D., Nixon, G. S., Noble, H. W. & Weipers, W. L. (1960). **Dental anatomy and histology of the dog.**—Res. vet. Sci. **1,** 201-204. [Authors' summary modified.] **3412**

The morphology of the teeth and the histological structure of the dental tissues of the dog are described. Reference is made to modifications associated with the specialized function of the dentition and to normal age changes.

Charton, A., Faye, P., Hervy, A. & Lefrançois, C. (1960). Fluctuations des taux de quelques constituants minéraux et azotés dans le sérum de brebis durant un cycle d'élevage. **[Fluctuations in mineral and protein constituents of the serum of sheep during a breeding cycle.]**—Rec. Méd. vét. **136,** 143-159. [Summaries in English and Spanish.] **3413**

In 22 ewes the urea content of the blood rose from the 4th month of gestation until the third month of lactation, the Mg content rose slightly during gestation, and the globulin content tended to fall in the fifth month of gestation, although the total protein content remained constant. Fluctuations in the inorganic P and the Ca content were not related to phases of the breeding cycle.

—M.G.G.

Baglioni, T., Locatelli, A. & Quarenghi, F. (1959). Le sieroproteine del vitello neonato in relazione all'ambiente (in stalla e all'aperto). **[Serum proteins of new-born calves in relation to environment.]**—Atti Soc. ital. Sci. vet. **13,** 395-397. [Summaries in English and French.] **3414**

Calves reared on pasture had a higher concentration of total proteins in serum (average 6·53 g./100 ml.) than calves reared in stalls (5·94 g./100 ml.).—R.M.

Pierce, A. E. & Johnson, P. (1960). **Ultracentrifuge and electrophoretic studies on the proteinuria of the new-born calf.**—J. Hyg., Camb. **58,** 247-260. [Abst. from authors' summary.] **3415**

The proteinuria arose mainly from low molecular weight protein in the colostrum which was absorbed from the gut together with the immune lactoglobulin. The protein of low molecular weight was subsequently cleared from the circulation probably by glomerular filtration. But the immune lactoglobulin with its much higher molecular weight was not so cleared from the circulation and was readily detected there. [See also *V.B.* **30,** 1860 & 2721.]

Newland, H. W., Davis, G. K. & Wallace, H. D. (1960). **Placental transfer of phosphorus in sows maintained on high and low levels of dietary manganese.** — Amer. J. Physiol. **198,** 745-748. **3416**

Labelled phosphate was injected i/p into 18 pregnant gilts. They were killed 3 hours after injection at 60, 80 or 110 days of pregnancy. Dietary Mn (5–7 p.p.m. or 90–100 p.p.m.) had no influence on absorption and concentration of radiophosphorus by the foetuses.—R.M.

Chalmers, T. M., Pawan, G. L. S. & Kekwick, A. (1960). **Fat-mobilising and ketogenic activity of urine extracts: relation to corticotrophin and growth hormone.**—Lancet, July 2nd, 6-9. [Authors' summary modified.] **3417**

In people who are actively mobilizing and utilizing fat the urine contains a polypeptide-like substance which causes transient hypoglycaemia, ketonaemia, and increased mobilization and catabolism of fat in mice, with depletion of body-fat stores. At a conc. of less than 1 μg. per ml. the material is active in releasing free fatty acids from rat adipose tissue. The pituitary is necessary for its production. It is apparently neither growth hormone nor corticotrophin.

Menkin, V. (1960). **Biochemical mechanisms in inflammation.** — Brit. med. J. May 21st, 1521-1528. [Author's summary modified.] **3418**

Inflammation is a manifestation of severe cell injury in vertebrates. The inflammatory reaction is initiated by disturbance in local fluid exchange. The most important alteration is a local increase in capillary permeability brought about largely by the liberation of leucotaxine by injured cells at the site of inflammation. This diffusible substance,

which appears to be a polypeptide, induces migration of leucocytes through the endothelial wall. Another mediator present in inflammatory exudates is termed the leucocytosis-promoting factor. This factor, in addition to the thermostable leucocytosis factor, provides a reasonable explanation for the mechanism of leucocytosis in inflammation.

The immunological implication of inflammation is discussed, and it is pointed out that the role of inflammation is that of a regulator of bacterial invasiveness. The pattern of injury in inflammation is ascribed to the liberation of a toxic euglobulin termed necrosin. Fever is shown to be due to two factors—namely, a thermostable component termed pyrexin, and a thermolabile factor.

Studies on the anti-inflammatory problem, which M. first described in 1940 and 1942, are summarized; and it is shown that the mechanism of action is a suppression of cellular activity. The injured cell is incapable of forming the mediators of inflammation as readily as under normal circumstances.

See also abst. **3296** (blood groups in horses).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

See abstr. **3164** (brucellosis); **3212** (toxoplasma survey in slaughter animals); **3213** (sheep as reservoir of toxoplasma); **3453** (list of veterinary films).

REPRODUCTION AND REPRODUCTIVE DISORDERS

Anon. (1959). **Colloquium on reproduction and artificial insemination of the pig organized at the "Centre National de Recherches Zootechniques" in Jouy-en-Josas, on the 25th and 26th of March 1959, by the European Association for Animal Production.** pp. 177. Paris: Institut National de la Recherche Agronomique. 8.50 NF. [In English.] **3419**

The proceedings of this meeting, published as a supplement to *Annales de Zootechnie*, comprises 20 papers by experts from nine countries. 16 papers are in English and the rest are in French.—R.M.

Kvasnitsky, A. V. (1959). Méthode fractionnée d'insémination artificielle des truies. [**Fractional method of artificially inseminating sows.**]—Ann. Zootech. **8,** Suppl. pp. 43-58. [Summary in English.] **3420**

An illustrated account of work previously published in Russian [*V.B.* **29,** 3657].—R.M.

Madden, D. H. L. (1959). **Field experience of pig A.I. in Hampshire, U.K.**—Ann. Zootech. **8,** Suppl. pp. 59-67. [In English. Summary in French.] **3421**

Data analysed in this paper included those obtained previously [*V.B.* **29,** 3659] plus an additional 847 first inseminations and 418 repeat inseminations.—R.M.

Cupps, P. T. & Laben, R. C. (1960). **Spermatogenesis in relation to spermatozoa concentration in bovine semen.**—J. Dairy Sci. **43,** 782-786. [Authors' summary modified.] **3422**

The correlation between the number of spermatids in standard sections of the seminiferous tubules and concentration of spermatozoa in 13 bulls in which the conc. ranged from 0·01 to 20·6 $\times$ 10^5 spermatozoa per microlitre was 0·82. The frequency of the various stages of the cycle of the seminiferous epithelium did not change until the conc. dropped below 5·0 $\times$ 10^5 spermatozoa per μl. Qualitative differences in the type of degeneration in the testicles were found in bulls having a low spermatozoa concentration.

Staples, R. E., Hansel, W., Foote, R. H. & Dunn, H. O. (1960). **Motility and fertility of progesterone- and estrogen-treated bovine semen.**—J. Dairy Sci. **43,** 787-795. [Authors' summary modified.] **3423**

The fertility of bull semen was not affected by progesterone and oestrogen in amounts as high as 5,000 and 200 μg per ml. of diluted semen, respectively. There was no demonstrable effect on the motility of semen treated with these hormones up to two days of storage at 5°C. Increased levels of progesterone (10,000 μg. per ml. of diluted semen) reduced the motility of semen after two days of storage. There was some indication that adding 5,000 μg. of progesterone in combination with 200 μg. of oestrogen per ml. of diluted semen may have altered the sex ratio of the resulting calves, increasing the proportion of males.

de Bois, C. H. W. (1960). Sectio Caesarea bij het rund. [**Caesarian section in the cow.**]—Tijdschr. Diergeneesk. **85,** 699-742. [In Dutch. Summaries in English and German.] **3424**

A detailed summary of indications,

techniques and results derived from 200 cases at the Utrecht clinic for veterinary obstetrics. —R.M.

Coulson, W. F. (1960). **17-oxosteroids of pregnant ewes' urine.**—Nature, Lond. **185,** 612-613. 3425

Four 17-oxosteroids were isolated from pooled urine of two ewes in the fourth month of pregnancy. Two of these compounds were tentatively identified as aetiocholanolone and dehydroepiandrosterone.

Because of the very low values found (per sheep per 24 hours: aetiocholanolone 100 μg.; dehydroepiandrosterone 25 μg.; unidentified compounds 125 μg.) "it was concluded that accurate quantitative estimation of 17-oxosteroids in sheep's urine could not be carried out by the usual methods.—N. Saba.

Dziuk, P. J. (1960). **Inhibition and synchronization of mating in the mouse by oral administration of progestins.** — Endocrinology **66,** 898-900. [Author's abst. modified.] 3426

Diets containing either progesterone or 6α-methyl-17α-hydroxy-progesterone acetate were fed to 95 adult female mice. Mating was inhibited in all cases. Inhibition was effective after a preliminary treatment period of 4 days and extended beyond end of treatment for at least 64 hours. Ingestion of treated diets by males did not affect their fertility or libido.

Schofield, B. M. (1960). **Hormonal control of pregnancy by the ovary and placenta in the rabbit.**—J. Physiol. **151,** 578-590. [Author's summary modified.] 3427

Virgin rabbits were made unilaterally pregnant by tying one Fallopian tube 6 hours after mating. On the 24th, 25th, or 26th day, one of the following was removed—ovaries, corpora lutea, foetuses, gravid horn, ovaries and gravid horn, products of conception.

It was found that the hormonal dominance changed from progesterone to oestrogen within 2 days in all these experiments except after removal of the foetuses. The corpus luteum was the main site of progesterone production.

When the placenta is removed the corpus luteum starts to regress and the secretion of progesterone presumably declines: the placenta is contributing some factor which is necessary, either directly or indirectly, for the continued life of the corpus luteum.

There is probably no very significant contribution of progesterone by the placenta.

After removal of the foetuses, "pregnancy" appeared to continue normally and was probably terminated at the usual time by loss of the placentas.

Erichsen, S. & Velle, W. (1960). **Studies on oestrogens in cattle. Oestrogen conversions in different tissues grown in vitro.** — Acta endocr., Copenhagen **34,** 27-32. [Authors' summary modified.] 3428

Cell sheets on glass were grown from bovine testicle, endometrium, amnion and liver. Interconversion of oestrone and oestradiol-17β was demonstrated in the presence of cells from amnion, endometrium and testicles. Only traces of oestrone were found following incubation of oestradiol-17α.

Lamond, D. R. (1960). **Gonadotrophins in rabbit serum after intravenous injection.**—J. Physiol. **151,** 403-409. [Author's summary.] 3429

The rate of decline of gonadotrophic activity of blood sera after i/v inj. of placental gonadotrophins into mature rabbits was determined by using the mouse uterine weight bioassay for gonadotrophin.

The rate of loss of activity both for human chorionic gonadotrophin (HCG) and for pregnant mare serum gonadotrophin (PMS) was independent of the amount of gonadotrophin injected. The PMS curve, however, was much flatter than the HCG curve.

The potency of both substances was greater than that expected from simple dilution in serum.

Usuelli, F. & Curto, G. M. (1959). Variazioni istochimiche nei testicoli di Gallus gallus durante le prime fasi dei trattamenti con stilbenici. **[Histochemical changes in the testicles of cocks during the initial stages of stilboestrol treatment.]**—Atti Soc. ital. Sci. vet. **13,** 139-141. [Summaries in French and German.] 3430

22 cocks a year old were implanted with 20 mg. diethylstilboestrol and were killed 1–21 days afterwards. In the seminiferous tubules and interstitial cells there was evidence of increase in lipids and slight decrease in ribonucleic acid and polysaccharides.—R.M.

Paredis, F. (1959). **Observations on the nature of "infertility" in sows and gilts.**—Ann. Zootech. **8,** Suppl. p. 109. [In English and French. Author's summary modified.] 3431

Sixty-one sows or gilts which were said not to be pregnant after at least two matings

were examined. Three of them showed no heat and were later found to be pregnant, the others were mated on the first and eventually on the 3rd day of the following oestrus to a fertile boar. Of these, 40 became pregnant immediately and 18 returned to oestrus, were re-mated and slaughtered 3 days later. In 12 of these the majority of the ova were fertilized, in 2 only, 2 or 3 ova were found to be cleaved and in 4 animals, one of which had not ovulated, no fertilization took place.

Almost all of the uteri were bacteriologically sterile: from one case pasteurella and from 2 others *Escherichia coli* were isolated.

The blood of all animals reacted negatively to brucella and leptospira antigens.

These findings indicate that faults in management may play a major role in infertility of pigs.

Harrop, A. E. (1960). **An aspect of infertility in the dog.** — Vet. Rec. **72,** 362-363 & 364. 3432

The sudden development of sterility in at least 25 young pedigree dogs of various ages and breeds after an initial successful period at stud has recently been observed. Apart from testicular atrophy in some, no abnormalities have been found and no treatment has been of any avail. Inherited factors may be involved.—A. Ackroyd.

Calisti, V. (1959). Forme ereditarie di sterilità nei bovini. **[Hereditary sterility in cattle.]** — Atti Soc. ital. Sci. vet. **13,** 51-129. Discussion: pp. 130-136. 3433

A general discussion, with references, of genital malformations, anomalies of gametes, neuro-endocrine disorders and lethal factors. —R.M.

Gahne, B., Rendel, J. & Venge, O. (1960). **Inheritance of β-globulins in serum and milk from cattle.** — Nature, Lond. **186,** 907-908. 3434

Working with Swedish Red and White cattle the authors confirmed Ashton's finding [*V.B.* **29,** 115] of six beta-globulin phenotypes. Components resembling the beta-globulin pattern of blood were seen on electrophoresis of colostral milk. Such components were only faintly visible in milk taken two months after calving.—R.M.

Kristjansson, F. K. (1960). **Inheritance of a serum protein in swine.**—Science **131,** 1681. [Author's summary modified.] 3435

A study of polymorphism of the starch-gel electrophoretic pattern for one of the blood serum proteins in pigs (tentatively designated protein B) reveals that it is controlled by a single pair of alleles exhibiting partial dominance. *BB* genotypes appear to have twice as much protein B as the *Bb* genotype, while *bb* genotypes show no evidence of the protein. The Yorkshire and Landrace breeds appear to differ in the frequency of these genes.

See also abstr. **3140** (non-specific tuberculin reactions in pregnant and parturient cows); **3165** (transmission of brucellosis during artificial insemination); **3166** (isolation of brucella from the placenta); **3184-3185** (vibriosis); **3186** (puerperal septicaemia in pigs); **3248** (histopathology in aborted equine foetuses after infection with equine abortion virus); **3336** (effect of triphenylbromethylene on egg production in hens); **3337** (oestrogenic effect of vegetable oils); **3348** (vitamin E activity of Se in turkey hatchability); **3444** (report, Netherlands); **3462** (book, reproduction in horses).

ZOOTECHNY

Harvey, C. N. (1959). **A bibliography of farm buildings research 1945-1958. Part I. Buildings for pigs.** pp. 36. London: Agricultural Research Council. 2s. 6d. 3436

This bibliography of 123 references sums up the present state of research on the environmental requirements of farrowing sows, piglets and fattening pigs. Omissions that might be worth including in a future edition are: German work on the toxicity of floor slabs prepared from bituminous materials (Fleischer *et al.*, 1956; Reuss 1956, 1958; Bentz *et al.*, 1957) and Russian work on ventilation requirements (Bobashinka, 1955; Zhmurin, 1959) and on hydrogen sulphide concentrations in piggeries (Chistov, 1953). —R.M.

Allen, G. G. (1958/59). **An Australian bibliography on sheep and wool production 1946-57. Parts 1 and 2.** pp. 111. Prospect, N.S.W: C.S.I.R.O. Sheep Biology Laboratory. 3437

This bibliography of work done in Australia has been compiled by the Librarian of the Sheep Biology Laboratory at Prospect in New South Wales. Part 1 lists 471 research publications under the names of authors only.

Part 2 contains 666 additional entries and the references have been classified under the headings anatomy & physiology; nutrition & metabolism; reproduction & growth; genetics & breeding; skin, fleece & wool; infectious diseases; parasitology; poisoning; apparatus & techniques and other headings including

popular articles published in the agricultural journals. It is hoped to issue an index to authors & subjects in both parts during 1960, and annual supplements.—R.M.

Betts, A. O., Lamont, P. H. & Littlewort, M. C. G. (1960). **The production by hysterectomy of pathogen-free, colostrum-deprived pigs and the foundation of a minimal-disease herd.**—Vet. Rec. **72,** 461-468. [Authors' summary modified.] 3438

Pathogen-free, colostrum-deprived pigs have been produced by hysterectomy using techniques developed in three phases from those of Young & Underdahl (1953) and Young, Underdahl & Hinz (1955). In the third phase each sow, 110 to 113 days pregnant, was stunned electrically and then anaesthetized with carbon dioxide gas. The whole uterus was removed aseptically and passed through an antiseptic lock into a sterile operating hood. Two operators working through long rubber gloves then tore the piglets from the uterus, dried them, and ligated the umbilical cords. The piglets were reared in sterile incubators supplied with heated, filtered air. The diet consisted essentially of Amvilac No. 1 (Glaxo) made up with water and sterilized by heat. Using this technique 16 sows have been subjected to hysterectomy, 167 piglets have been obtained alive from the sows' uteri and, of these, 156 have been reared giving a survival rate of 93·4%. Over the whole period of development of this technique, 39 litters have been reared. Of the 384 piglets obtained alive 316 have been reared giving an overall survival rate of 82·3%.

From the progeny of 5 sows a minimal-disease herd was established and has been kept under farm conditions since September 1958.

TECHNIQUE AND APPARATUS

Gagliardi, G. & Borghi, G. (1959). Tripsinizzazione del rene di vitello alle temperature di+37°C e 4°C. **[Trypsinization of calf kidney at 37° and at 4°C.]**—Atti Soc. ital. Sci. vet. **13,** 536-538. [Summaries in English and French.] 3439

Better cell cultures were obtained from kidney suspension trypsinized at 4° for 20 hours than at 37°.—R.M.

Carey, L. E. & Hahon, N. (1960). **Combination egg candler and chorioallantoic membrane dropping apparatus.**—J. Bact. **79,** 310-311. 3440

The apparatus, which is described and illustrated, facilitates the preparation of embryonated eggs for chorioallantoic membrane inoculation by combining egg candling with the dropping of the chorioallantoic membrane by vacuum.—T.E.G.R.

Anderson, N. F., Delorme, E. J., Woodruff, M. F. A. & Simpson, D. C. (1959). **An improved technique for intravenous injection of newborn rats and mice.**—Nature, Lond. **184,** Suppl. No. 25, pp. 1952-1953. 3441

An injection apparatus and method is described suitable for the i/v inj. of new-born rats and mice. Using this method the failure rate was about 5%.—W. E. Parish.

See also absts. **2202** (cultivation of trypanosomes); **3216** (laboratory diagnosis of toxoplasmosis); **3234** (cultivation of swine pox virus); **3243** (tissue culture of encephalitis viruses); **3257** (separation of scrapie virus from brain tissue); **3283** (tissue culture of avian bronchitis virus); **3291** (titration of anti-viral serum in kidney cell culture); **3321** (egg-counting in faeces); **3451** (book, urine of dog and cat: analysis and interpretation).

REPORTS

Gt. Britain. (1960). **Committee for Colonial Agricultural, Animal Health and Forestry Research 1958-1959.** pp. 176. London: Agricultural Research Council. 3442

An Institute has been set up in Kenya for research on Foot and Mouth Disease which will collaborate with the Research Institute at Pirbright.

Bovine Contagious Pleuropneumonia continues to give trouble. Entirely satisfactory vaccines have not as yet been made in Africa.

Rinderpest control in Kenya has steadily extended but the discovery of the disease in goats in part of Uganda raises a new problem. Reservoirs of the virus in game are receiving more attention and the agar gel double diffusion precipitation test is of much practical value for diagnosis.

The rapid extension of the staff of the East African Research Organization has not been maintained in 1958 owing to the difficulty of finding suitable candidates for vacant posts.

Information is urgently needed on the

period of survival of beef "measles" cysts in infected cattle and a long-term experiment has been planned to investigate this problem in collaboration with the University of Glasgow in fully susceptible calves in Scotland.

Research into veterinary problems has been carried out in such diverse countries as East Africa, Cyprus, Jamaica, Nigeria and Nyasaland.—D. S. Rabagliati.

Bahamas. (1959). **Annual report of the Agricultural and Marine Products Board for the year ending 31st December 1958.** pp. 25. [Contains report of Government Veterinary Officer (Leam, G.) Appendix C.] 3443

Anaplasmosis occurred among cattle from the U.S.A. which became infected after arrival. The mortality was 30%. The symptoms were "acute febrile conditions, anaemia, weakness and then death." The survivors developed immunity. In treating the disease in these susceptible cattle tetracycline was used in conjunction with vitamin B_{12} and iron supplements.

Tetanus. In one district 20 horses died of the disease. In animals showing symptoms of the disease "muscle relaxants and control of spasms with curare-like compounds and chloropromazine were used." Six of ten selected cases treated on these lines recovered. They were a horse, a donkey, 2 dogs, a bull and a pig.

There have been no other epidemic diseases of domestic animals. Anthrax and Swine Fever did not occur during 1958.

The general improvement in animal husbandry has reduced the incidence of Paratyphoid, Parasitism and Piglet Anaemia.

In sheep and goats treatment for Helminths, including Nodular Disease, increased in numbers. Mastitis in a herd of goats was treated successfully with antibiotic intramammary injections. Two goats from Haiti had the rumen impacted with mango seed. This had caused atrophy of the abdominal muscles.

Fowl Pox and Laryngotracheitis outbreaks were recorded. The poultry industry appears to be developing well.

—J. A. Griffiths.

Netherlands. (1960). Mededelingen betreffende de Gezondheidsdienst voor Vee in Friesland. 40e Jaarverslag. **[Annual report of the Health Service for Livestock in Friesland for 1958-1959.]** pp. 98. Leeuwarden: Gezondheitsdienst voor Vee. 3444

This report contains a special article on the first 40 years of the Health Service (pp. 10–25). A department for pig diseases started work in October 1958 and 315 herds of pigs were inspected. Positive reactions to Tuberculin: occurred in only 9 of 238,000 cattle tested and TB. was confirmed in 4 of them. Avian TB. among yearling stock on one farm was attributed to infection from ducks. There was further progress in the control of Bovine Brucellosis: 15,760 herds (78·6%) were declared free from the disease and a further 11·5% had had three consecutive negative ring tests. From Liver Fluke control trials it appeared that spraying 1% pentachlorophenol into ditches and the banks of streams gave good control, but did not eradicate infection. During the year 133 bulls were examined for use in A.I. and 35 were rejected. 325 bulls were examined for export and 35 were rejected, mainly on account of poor quality semen. A further 130 infertile bulls were examined and the findings are given (pp. 46–52).—R.M.

U. S. A. Montana. (1959). **Report to the Montana Livestock Sanitary Board, July 1, 1958-June 30th, 1959.** [Safford, J. W.] pp. 53. Helena, Montana: The Board. 3445

Veterinarians reported 51 cattle diseases as affecting 10,940 cattle on 3,929 ranches. Actinobacillosis and Actinomycosis were twice as prevalent as in the preceding year. No case of Anthrax occurred. Bacillary Haemoglobinuria continues to increase in Western Montana and Blackleg which has been present for many years still persists. Farmers are criticised for not having all their cattle vaccinated against it as they thus continue to incur great monetary losses.

During the year, 45,789 cattle were tested for Brucellosis with 287 reactors (0·62%). The incidence of this disease is declining and every effort is being made to eradicate it. In 1947, 6,321 cases of human infection were reported but in 1958 they were reduced to 802.

The Tuberculin Test was applied to 14,680 dairy and to 19,780 beef cattle. Only three animals were classified as reactors and none of these confirmed on P.M. examination.

Montana veterinary surgeons reported 24 sheep diseases in 240 ranches and 17 diseases of pigs affecting 1,253 head on 186 premises.

The Livestock Sanitary Board inspected

2,142,530 animals (including 85,007 poultry) during the year.

Details of all diseases met with and the number of herds affected are tabulated as also are the findings of the pathologist and the bacteriologist.—D. S. Rabagliati.

BOOK REVIEWS

Dzasokhov, G. S. (1959). **[Diagnosis of protozoal diseases of animals.]** pp. 416. Moscow: Gosud. izdatel'stvo sel'skokhoz. literatury. 8 r. [In Russian.] 3446

This book clearly describes the differences between various protozoal diseases and between protozoal and non-protozoal diseases having common symptoms. Horses, cattle, sheep, pigs, dogs, rabbits and fowls are dealt with. It is valuable for distinction between *Babesia bigemina, Francaiella colchica* and *Babesia bovis* infections of cattle. The first 140 pages are devoted to general protozoology. These include five on the development of haemosporidia in ticks. The bibliography comprises 27 pages of Russian references and 8 pages of non-Russian. An English translation would make interesting reading.—R.M.

Vaccari, I., Ballarini, G., Pieresca, G., Bertoni, L. & Semellini, L. (1959). Attività svolta dal "Centro Ricerche Malattie degli Uccelli [F.O.I.]" durante il triennio 1956-1957-1958. Argomenti di patologia e clinica degli uccelli "da gabbia e da voliera". **[Report of the Research Centre for diseases of cage birds.]** pp. 107. Faenza: Edizioni La Nuova Veterinaria. 3447

The organization and activities of the Research Centre, which was set up in 1955, are dealt with in the first part of this report and details are given of laboratory examinations carried out during the period under review. The second part deals, in general terms, with diseases and nutrition of birds bred in captivity (as distinct from recently captured birds). In the third part are described specific diseases (caused by viruses, bacteria, protozoa and fungi), organic diseases, nutritional and metabolic disorders and poisoning (dioxane, DDT and phosphoric esters).—T.E.G.R.

Wilson, F. (1960). **A review of the biological control of insects and weeds in Australia and Australian New Guinea.** pp. v+102. Farnham Royal: Commonwealth Agricultural Bureaux. 25s. [Technical communication No. 1 of the Commonwealth Institute of Biological Control, Ottawa, Canada.] 3448

This excellent review deals mainly with fruit, vegetable and timber pests, nine of which have been substantially controlled by the use of artificial predation or parasitization. Insect or bird control of the sheep blowfly (*Lucilia cuprina*), buffalo fly (*Siphona exigua*) and cattle tick (*Boophilus microplus*) have so far failed although in some habitats mosquitoes have been largely controlled following the introduction of such fish as *Gambusia*.

Of the poisonous weeds St. John's wort (*Hypericum perforatum*) was partially controlled by *Chrysomela* beetles, but control of ragwort (*Senecio jacobaea*) was unsuccessful.

The bibliography contains over 550 references.—W. N. Beesley.

Stewart, H. L., Snell, K. C., Dunham, L. & Schlyen, S. M. (1959). **Atlas of tumor pathology. Section XII, Fascicle 40. Transplantable and transmissible tumors of animals.** pp. 378. Washington, D.C.: Armed Forces Institute of Pathology. $3.50. 3449

This fascicle contains accounts of 50 currently-existing transplantable tumours (of which a few are also transmissible by cell-free material) from mice (30), rats (10), rabbits (3), dogs (2), fowls (2), hamster, guinea-pig and frog (one each). The tumours have been chosen to represent the much larger number of transplantable tumours derived from those occurring spontaneously or (in a few instances, such as the liposarcoma produced in the subcutis of a guinea-pig by the injection of methylcholanthrene) induced experimentally.

Some of the tumours, such as mouse sarcoma 37, Jenset rat tumour, Brown Pearce rabbit tumour, are included because of their historical as well as of their current importance, while others are chosen to represent such specially interesting tumours as those of the endocrine or reproductive systems (such as the Furth pituitary or Leydig-cell tumours of mice).

The authors have in most cases had available for study animals bearing transplants, and in others have had access to pathological material from such animals. They have as far as possible also examined material from the original primary tumours, and from intermediate transplant generations, and have con-

sulted not only reports in the literature but also workers who have made particular studies of the various tumours. The result is that the fascicle contains a wealth of information not otherwise easily accessible.

After a historical and general introduction (the first paragraph of which contains an account of the horrifying result of Peyrilhe's pioneering attempt, almost 200 years ago, to transplant a human breast cancer under the skin of a dog), the various tumours are dealt with according to the body system in which they arose, a final section being devoted to tumours of undetermined site of origin and of undifferentiated histological pattern.

Each tumour is first defined, and then an account is given of the original tumour and of its transplantation history. The bulk of each chapter is given over to an excellently illustrated account of the macroscopic and (in particular) of the microscopic features of current transplants.

This book will be of interest to veterinary pathologists, partly because of the wealth of illustrations of histological appearances of tumours, and partly because of the account of four tumours of more immediate veterinary interest—lymphoid tumour RPL-16 and Rous sarcoma of fowls, canine "Carcinoma No. 1" of Allam, Lombard, Stubbs and Shirer (a presumed thyroid tumour), and canine transmissible venereal tumour. The last named was the first experimentally-transplanted tumour, and due reference is made to the work of the man whom Shabad has called "The forefather of experimental oncology."

The fascicle is of the usual outstanding quality of this series, and is surprisingly low in price. One minor criticism might be made —the account of myxomatosis (in the chapter on Shope rabbit papilloma) is so brief as to be somewhat misleading.—E. COTCHIN.

—. (1960). **British national formulary, 1960.** pp. 272. London: British Medical Association and Pharmaceutical Press. 7s. 6d. **3450**

Revision of this handy list of official drugs and preparations in current use has resulted in 70 additions and 27 deletions compared with the 1957 edition. It combines within a small volume (11 x 17 cm.) the preparations of the B.P. and the B.P.C. and in addition it lists proprietary names. Veterinary surgeons will find it useful for referring to drugs not given in The British Veterinary Codex.—R.M.

Bloom, F. (1960). **The urine of the dog and cat: analysis and interpretation.** pp. xi + 84. New York: Gamma Publications, Inc. **3451**

This is a useful little book for small-animal practitioners and students. Technique and interpretation of all the conventional tests are given, and there are also notes on the various proprietary test reagents. The chemical tests for identifying urinary calculi are valuable because it is not easy to locate these tests in the standard veterinary books. —R.M.

Nishikawa, Y. (1959). **Studies on reproduction in horses: singularity and artificial control in reproductive phenomena.** pp. xii + 340. Tokyo: Japan Racing Association. **3452**

This is a compilation of 69 articles written by the author and his colleagues over the past 15 years. It is particularly valuable because many of the papers, such as those published in the Japanese Journal of Zootechnical Science and Japanese Journal of Veterinary Science, are now printed in English for the first time.

The thirteen chapters are: development of the reproductive glands; seasonal variation in reproductive function and its artificial control; natural and artificially-induced oestrus; determination of the corpus luteum stage in horses by reaction to an injection of oestrogen, and its utilization in pregnancy diagnosis; effects of continuous injection of oestrogen; maintenance of the corpus luteum and prevention of habitual abortion; sensitivity of the ovaries to gonadotrophins; ovulation and its artificial induction; properties of vaginal mucus; semen properties and artificial insemination; reproduction in jenny asses; semen and A.I. in asses; reproductive ability of mules. The book concludes with a list of the articles that have been used.—R.M.

Anon. (1959). **Methods for the examination of poultry biologics. A report of the poultry diseases sub-committee on animal health in co-operation with the regional technical committees on respiratory diseases of poultry of the Agricultural Experiment Stations.** pp. 127. Washington, D.C.: National Academy of Sciences — National Research Council. $3.00. **3453**

This manual will be of immediate value to

those who are concerned with the laboratory diagnosis and preparation of vaccines against respiratory infections and virus diseases of poultry and those who are interested in the problems of vaccine production.

The committee which produced the book includes some well known names associated with reliable work in this field for years. In the introduction it is stated that the purpose of the manual is to describe "standard procedures used in investigations, which the uninitiated may use as a guide and the experienced as a reference". This purpose has been effectively achieved.

The main concern was to collect and present the best methods available for the evaluation of vaccines, its contents will be used by many who have little present concern with vaccines. A chapter is devoted to each of the respiratory diseases and to fowl pox; other chapters describe quantitative methods and vaccine testing. All procedures such as the estimation of the LD_{50} and M.L.D., the haemagglutination-inhibition test and the virus neutralization test, are described step by step in a manner which is very easy to follow. There are a number of very useful tables and a wealth of references.

The most appreciative users of this manual will naturally be those who are actually working with poultry viruses. But all veterinarians concerned with the poultry industry may profit considerably from reading it. Apart from obtaining useful information, they will gain, if they do not already possess it, some idea of the expenditure of time and labour required for the isolation and identification of viruses and will appreciate why the accurate differential diagnosis of respiratory diseases in poultry cannot be easily or rapidly carried out.

This book might have been given a better title more indicative of its breadth and appeal.

—B. S. Hanson.

BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review]

Duncan, D. L. & Lodge, G. A. (1960). **Diet in relation to reproduction and the viability of the young. Part III. Pigs.** pp. vii+106. Farnham Royal: Commonwealth Agricultural Bureaux. [Technical Communication No. 21 of the Commonwealth Bureau of Animal Nutrition.]. 20s.

Euzéby, J. (1960). Le parasitisme en pathologie aviaire: notions de synthèse. **[Parasites in avian pathology.]** pp. 105. Paris: Vigot Frères.

Harrop, A. E. (1960). **Reproduction in the dog.** pp. x+204. London: Baillière, Tindall & Cox. 30s.

Hawker, L. E., Linton, A. H., Folkes, B. F. & Carlile, J. J. (1960). **An introduction to the biology of micro-organisms.** pp. vii+452. London: Edward Arnold (Publishers) Ltd. 35s.

Kotlan, A. (1960). Helminthologie. Die Helminthosen der Haus- und Nutztiere unter Berücksichtigung der Helminthosen des Menschen. **[Helminths of animals and man.]** pp. 631. Budapest: Hungarian Academy of Science.

Mason, I. L. & Maule, J. P. (1960). **The indigenous livestock of Eastern and Southern Africa.** pp. xv+151. Farnham Royal: Commonwealth Agricultural Bureaux. [Technical Communication No. 14 of the Commonwealth Bureau of Animal Breeding & Genetics.] 45s.

Messow, C. (1960). Regeneration und Entzündung vom Standpunkt der vergleichenden Pathologie. **[Regeneration and inflammation from the point of view of comparative pathology.]** pp. 253. Hanover: M. & H. Schaper.

Nowakowski, H. (Edited by) (1960). Moderne Entwicklungen auf dem Gestagengebiet. Hormone in der Veterinärmedizin. Sechstes Symposion der Deutschen Gesellschaft für Endokrinologie Kiel, den 28. bis 30. April 1959.

[Progress in the field of gestagens. Hormones in veterinary medicine. Proceedings of the 6th Symposium of the German Society for Endocrinology held at Kiel in April 1959.] pp. viii + 441. Berlin (Göttingen & Heidelberg): Springer. DM 96.

Parnas, J. (1960). Antropozoonozy: choroby odzwierzece człowieka. **[Anthropozoonoses: diseases transmissible to man.]** pp. 319. Warsaw: Państwowy Zakład Wydawnictw Lekarskich. zl. 55.

Yapp, W. B. (1960). **An introduction to anima physiology.** pp. xix + 423. Oxford: Clarendo Press. 2nd edit. 25s.

—. (1960). **Papers dedicated to Dr. Nicol Plum, Director of the Danish State Veterinar Serum Laboratory on the occasion of h seventieth birthday, the 8th September, 196** pp. 293. Copenhagen: C. F. Mortensen Ltd

Anon. (1960). **Herb I.M.I. handbook. Method in use at the Commonwealth Mycologica Institute.** pp. 103. Kew: Commonweal Mycological Institute. 12s. 6d.

Printed in Great Britain by CHARLES BURRELL & SON, Chertsey, Surrey.

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CONTENTS

	Page
Diseases caused by Bacteria and Fungi	605
Diseases caused by Protozoan Parasites	621
Diseases caused by Viruses and Rickettsia	624
Immunity	632
Parasites in Relation to Disease [General]	633
Parasites in Relation to Disease [Arthropods]	633
Parasites in Relation to Disease [Helminths]	635
Spontaneous and Transmissible Neoplasms and Leucaemias [Including Fowl Paralysis]	641
Nutritional and Metabolic Disorders	642
Diseases, General	645
Poisons and Poisoning	649
Pharmacology and General Therapeutics	651
Physiology, Anatomy and Biochemistry	653
Public Health, Veterinary Services and Veterinary Education	656
Livestock Hygiene	658
Reproduction and Reproductive Disorders	658
Zootechny	660
Technique and Apparatus	660
Reports	661
Book Reviews	664
Books Received	666

INDEX TO AUTHORS

Abbate, A., 3733.
Abdel-Raouf, M., 3735.
Adams, A., 3713.
Adutskevich, V. A., 3480, 3482.
Akhmedov, A. M., 3514.
Aksenov, N. S., 3684.
van Albada, M., 3751.
Alexander, A. D., 3523.
Allen, J. R., 3705.
Alloui, P., 3581.
Altucci, P., 3590, 3591.
Annau, E., 3499.
Annison, E. F., 3739.
Anton, A. H., 3714.
Di Antonio, E., 3607.
Antonova, M. E., 3691.
Armstrong, M. C., 3685.
Aronow, L., 3719.
Arskii, K. T., 3695.
Athanasiadou, M., 3500.
Austwick, P. K. C., 3532.
Avellini, G., 3655.
Avery, R. J., 3498.

Babcock, W. E., 3550.
Bachrach, H. L., 3564.
Bairamov, N., 3514.
Baker, J. A., 3674.
Balaščák, J., 3576.
Bálintffy, L., 3700.
Ballarini, G., 3536.
Bankowski, R. A., 3551.
Barron, D. H., 3728.
Bartko, P., 3659.
Bdolach, A., 3515.
Bellville, J. W., 3720.
Belter, L. F., 3516.
Beninghaus, T., 3503.
Benzie, D., 3657.
Berman, D. T., 3466, 3519.
Bertoni, L., 3536.
Beye, H. K., 3645.
Bianchi, E., 3690.
Bigland, C. H., 3729.
Bills, C. B., 3505.
Biondi, E., 3485.
Bloom, H. H., 3599.
Bohosiewicz, M., 3747.
Bolkhovitinov, D. Z., 3640.
Bonaduce, A., 3557.
Bouckaert, J. H., 3488.
Boyarshinov, P. K., 3480, 3482.
Boyd, C. E., 3716.
Boyne, A. W., 3657.
Bozděch, V., 3554.
Bradley, O. C., page 666.
Branion, H. D., 3544.
Breza, M., 3626.
Brînzoiu, M., 3534.
Brion, A., 3581.
Bronner, F., page 666.
Brook, A. H., 3724.
Brouwers, G. W. M. van Golstein, 3529.
Brown, D. L., 3762.
Brown, H., 3605.
Brown, J. M. M., 3704.
Brumbaugh, J. H., 3664.
Buonanno, G. A., 3590, 3591.
Burch, G. R., 3617.
Butler, M., 3541.
Butyrina, P. S., 3474.
Buu-Hoï, N. P., 3566.
Buxton, A., 3496.

Le Cain, A., 3588.
Calaprice, A., 3592, 3738.
Campbell, D. J., 3633.
Canu, B., 3687.
Capurso, A., 3494.
Carbrey, E. A., 3521.
Carrara, O., 3696.
Catron, D. V., 3543.
Cella, F., 3647.
Cerruti, C. G., 3495.
Chebotarev, I. E., 3684.
Cheremisin, G. G., 3511.
Chernin, V. G., 3648.
Childs, G. R., 3705.
Christoph, H.-J., 3775.
Ciurea, V., 3584.
Claringbold, P. J., 3721.
Clements, F. W., 3669.
Colombo, S., 3692.
Comar, C. L., page 666.
Comodo, N., 3732.
Contini, A., 3540.
Cook, J., 3770.
Cornwall, J. B., 3730.
Correa, W. M., 3627.
Corticelli, B., 3686, 3687, 3694.
Cotteleer, C., 3636.
Cravens, W. W., 3705.
Cruickshank, R., page 666.
Csontos, J., 3582.
Culzoni, V., 3740.

Daikos, G. K., 3500.
Dalgarno, A. C., 3657.
Danilevskii, V. M., 3742.
Davies, D. G., 3462.
Davies, J. B., 3616.
Debackere, M., 3725.
Dehority, B. A., 3666.
Deinhardt, F., 3600.
Deligeorgi, E., 3500.
DeMattei, J. D., 3505.
Demidov, N. V., 3620.
Devos, A., 3491.
Dhennin, L., 3566.
Diamond, D. L., 3633.
Dickinson, E. M., 3550.
Dickmann, Z., 3758.
Donker-Voet, J., 3529.
Donnelly, A. D., 3477.
Doroshko, I. N., 3527.
van Dorssen, C. A., 3471, 3529, 3530.
Dozza, G., 3710.
van Drimmelen, G. C., 3517.
Duckworth, J., 3657.
Duke, B. O. L., 3644.
Dunsmore, J. D., 3631, 3632.
Durbin, C. G., 3745.

Eaton, H. D., 3666.
Ectors, F., 3561, 3678.
Elliott, D. C., 3628.
Elliott, H. B., 3459.
Englert, H. K., 3583.
Erdmann, A. A., 3466.

Fedorov, V. N., 3486.
Fennel, P. J., 3720.
Ferenčík, M., 3697.
Ferrando, R., 3566.
Ferri, A. G., 3627, 3649.
Filatov, I. P., 3615.
Fish, N. A., 3604.
Fisher, E. W., 3637.
Fontaine, M., 3581.
Foršek, Z., 3525.
Foster, R. G., Jr., 3643.
Fraser, A., page 666.
Frik, J. F., 3529.
Fritsch, R., page 666.
Fuentes Marins, R., 3562.
Fujihara, H., 3681.
Fujimoto, Y., 3681.
Furmaga, S., 3634.

Galanis, N., 3504.
Galligani, G., 3711.
Gambino, O., 3593.
Garner, R. J., 3744.
Geurden, L. M. G., 3491.
Gibson, H. B., 3669.
Gilbert, Y., 3584.
Gillespie, J. H., 3674.
Girard, M., 3580, 3581.
Glover, T. D., 3759.
Göksu, K., 3552.
Goldstein, A., 3719.
Goldstein, H. E., 3672.
Gordon, F. B., 3599.
Goret, P., 3580, 3581, 3584.
Gosslee, D. G., 3666.
Goto, M., 3680, 3681.
Gourlay, R. N., 3457.
Gräub, E., 3468.
Grahame, T., page 666.
Gray, A. R., 3546.
Gray, D. F., 3492.
Gray, D. M., 3455.
Grégoire, C., 3636.
Grifo, A. P., Jr., 3666.
Grigoryan, G. A., 3623.
Grishin, V. M., 3567.
de Gruchy, P. H., 3675.
Güralp, N., 3608.
Gurova, E. I., 3527.

Hadlow, W. J., 3578.
Hafez, E. S. E., 3654.
Halaša, M., 3697.
Harley, O. C., 3492.
Harnach, R., 3460.
Hart, R. J., 3611.
Hays, V. W., 3543.
Hazzard, D. G., 3666.
Heeschen, W., 3638, 3703.
Hejlíček, K., 3473.
Helmboldt, C. F., 3666.
Henderson, W., 3497.
Henle, G., 3600.
Herman, M. A., 3699.
Hidiroglou, M., 3661.
Hill, R., 3657.
Hindmarsh, W. L., 3748.
Hoekstra, J., 3594.
Howeler, J. F., 3669.
Howland, W. S., 3720.
Hull, R. N., 3643.
Humphrey, G. L., 3571.
Hungate, D. P., 3734.
Hungate, R. E., 3734.
Hurst, E. Weston, 3574.
Huygelen, C., 3570, 3575.

Ignatov, V. A., 3527.
Il'ina, Z. M., 3693.
Ireland, H. R., 3614.
Isa, J. M., 3558.
Itagaki, K., 3681.
van Iterson, W., 3539.
Izzi, R., 3494, 3495, 3526.

Jaartsveld, F. H. J., 3529.
Jabara, A. G., 3651.
Jackson, R., 3663.
Jamieson, S., 3464.
Jamison, S. L., 3551.
Jaumin, J., 3636.
Jeoffery, S. M. S., 3531.
Jíra, J., 3554.
Jorgensen, T. W., 3749.
Johnson, B. C., 3667.
Jones, L. M., 3518.
Junge, H. R., 3749.
Jungherr, E. L., 3666.
Jurášek, V., 3626.

Kamarli, A. P., 3615.
Keating, J., 3658.
Keen, H., 3671.
Keep, J. M., 3533.
Keith, R. K., 3629.
Kemp, G. E., 3571.
Kenzy, S. G., 3531.
Kilian, J. G., 3550.
Kingscote, A. A., 3633.
Kleikamp, I., 3478.
Kline, L. B., 3603.
Klingman, G. I., 3718.
Knight, C. J. G., 3541, 3542.
Knight, G. J., 3538.
Kochurin, A. I., 3510.
Kocot, M., 3746.
Körting, H. J., 3555.
Koestner, A., 3556.
Kolesov, S. G., 3763.
Koppanyi, T., 3706.
Koshukov, S. D., 3509.
Kovács, J., 3700.
Kuck, N. A., 3715.
Kukharkova, L. L., 3480, 3482.
Kulasiri, C., 3560.

Labzoffsky, N. A., 3604.
Lämmler, G., 3619.
Lambelin, G., 3561, 3678.
Lamond, D. R., 3754.
Langer, P. H., 3674.
Lascelles, A. K., 3721.
Leahy, J. S., 3702.
Leinati, L., 3696.
Levaditi, J., 3588.
Light, F. W., Jr., 3688.
Littlejohns, I. R., 3545.
Locatelli, A., 3727.
Londrillo, A., 3463.
Lorenzutti, G., 3590, 3591.
Lostia, G. B., 3512.
Loy, R. G., 3756.
Lukas, G. N., 3467.
Lyubashenko, S. Y., 3567.

Macarie, I., 3534.
McCarthy, P. H., 3676.
McDiarmid, A., 3502.
McDonald, M. W., 3761.
Mace, D. L., 3505.
McEntee, K., 3674.
MacGregor, A., 3734.
McIntyre, W. I. M., 3637.
McKay, K. A., 3544.
McKay, K. G., 3455.
MacKellar, J. C., 3679.
McQueen, J. L., 3569.
Maggio, V., 3495.
Magrassi, F., 3590.
Magwood, S. E., 3499.
Málková, D., 3573.
Mamay, H. K., 3599.
Mameesh, M. S., 3667.
Mammerickx, M., 3561.
Mandelli, G., 3696.
Mann, P. H., 3454.
Manthei, C. A., 3506.
Margherita, G., 3590, 3591.
Marsh, H., 3665.
Martin, W. H., 3553.
Martins, L. F., 3627.
Matera, E. A., 3649.
Maynert, E. W., 3717, 3718.
Mayr, A., 3572.
Mehring, A. L., Jr., 3664.
Mellen, W. J., 3764.
Melvin, P. A., 3574.
Mesáros, E., 3460.
Meschia, G., 3728.
Messow, C., 3776.
Meyer, H., 3662.
Mikailov, M., 3514.
Mimioğlu, M., 3608.
Mingle, C. K., 3501.
Mohr, W., 3587.
Molinari, P., 3733.
Moore, C. L., 3656.
Morehouse, G. L., 3497.
Morettini, B., 3731.
Mornet, P., 3584.
Morrant, A. J., 3753.
Morris, B., 3513.
Morris, L. R., 3737.
Mosimann, W., 3773.
Mott, L. O., 3553.
Münker, W., 3478.
Mura, D., 3456.
Murphy, T., 3720.

Namioka, S., 3490.
Nelkor, J. E., 3755.
van Ness, G. B., 3459.
Neumann, R., 3472.
Newman, A. P., 3663.
Nielsen, S. W., 3652.
Noble, J. L., 3492.
Noorlander, D. O., 3455.
Nordland, O. S., 3481.
Novikova, M. P., 3476.
Noyes, R. W., 3758.

O'Brien, J., 3754.
O'Hara, P. J., 3663.
Ohshima, K., 3681.
Ollerenshaw, J. A., 3752.
Opdyke, D. L., 3707.
Osada, A., 3490.
Oser, B. L., 3708.
Oser, M., 3708.
Osetrov, A. A., 3684.
Osinga, A., 3621.
Ostendorf, J., Jr., 3497.
Ovaert, W., 3488.
Ozerskaya, V. N., 3641.

Palacios García, C., 3562.
Pallotta, A. J., 3706.
Palmer, F. P., 3535.
Panasyuk, D. I., 3639.
Papadoyanakis, N., 3500.
Papp, K., 3602.
Patterson, D. S. P., 3469, 3470, 3475.
Patty, R. E., 3564.
Paul, I., 3534.

Pavlovich, L. A., 3691.
Paynter, O. E., 3707.
Pedini, B., 3731, 3732.
Peery, T. M., 3516.
Peeters, G., 3725.
Peirce, A. W., 3660.
Peltola, P., 3668.
Pepevnak, F. L., 3586.
Perova, P. V., 3480, 3482.
Petersen, H. W., 3749.
Peterson, E. H., 3549.
Peterson, J. E., 3508.
Pezzoli, G., 3647.
Phillips, G. D., 3734.
Phillips, P. H., 3698.
Pickford, M., 3726.
Pieresca, G., 3536.
Pignatelli, P., 3565.
Pilet, C., 3581.
Pini, A., 3598.
Pisanu, S., 3456.
Placidi, L., 3577.
Pledger, R. A., 3564.
Pleva, J., 3503.
Pleva, V., 3460.
Polony, R., 3576.
Polyakova, O. I., 3639.
Pomeroy, B. S., 3595.
Popov, V. I., 3691.
Pouplard, L., 3636.
Preston, P. T., 3752.
Prevost, R., 3661.
Pridham, T. J., 3589.
Prokof'eva, M. T., 3527.
Prystowsky, H., 3728.
Pulles, H. A., 3677.
Pulsford, M. F., 3596.

Quarenghi, F., 3727.
Quesada, A., 3494, 3592.
Quinn, L. Y., 3543.
Quisenberry, J. H., 3643.

Raiha, N., 3701.
Ranney, A. F., 3465.
Rase, F., 3636.
Raun, E. S., 3610.
Razin, S., 3542.
Reculard, P., 3588.
Redfearn, M. S., 3519.
Redin, G. S., 3715.
Reich, M., 3743.
Reichel, K., 3680.
Reid, C. S. W., 3730.
Reznichenko, L. P., 3695.
Rice, C. E., 3499, 3601.
Rich, G. B., 3613, 3614.
Riek, R. F., 3629.
Ringen, L., 3520.
Ringen, L. M., 3522.
Rispens, B., 3594.
Robinson, K. W., 3737.
Robinson, M. C., 3766.
Robson, D. S., 3674.
Roby, T. O., 3553.
Roe, J. E. R., 3769.
Rogers, W. P., 3646.
Romić, Z., 3525.
Romváry, J., 3582.
Rosenberger, G., 3638, 3703.
Rousseau, J. E., Jr., 3666.
Ruiz, A., 3548.
Ruys, A. C., 3539.
Ryan, C. B., 3643.

Sakazaki, R., 3490.
Sakharova, R. M., 3691.
Sakurai, Y., 3650.
Santus, L., 3733.
Sapio, U., 3590, 3591.
Satoh, H., 3680, 3681.
Saulmon, E. E., 3553.
Savage, A., 3558.
Sayin, F., 3608,3609.
v.d. Schaaf, A., 3529.
Schaible, P. J., 3489.
Schelling, E. P., 3593.
Schindler, R., 3587.
Schink, Z., 3700.
Schleger, A. V., 3723.
Schwarte, L. H., 3579.
Schwinghamer, L. A., 3709.
Seifert, H., 3461.
Semellini, L., 3536.
Sergeeva, T. Y., 3691.
Shiff, C. J., 3625.
Short, B. F., 3724.
Shubin, V. A., 3563.
Shuttleworth, A. C., 3774.
Sierens, R., 3488.
Siller, W. G., 3606.
Silver, M., 3736.
Sinclair, K. B., 3622.
Sirigu, A., 3642.
Skoda, R., 3568.
Smith, F. F., 3455.
Smith, G. R., 3484.
Smythe, R. H., 3774, page 666.
Snair, D. W., 3709.
Soulsby, E. J. L., 3630.
Speer, V. C., 3543.
Sperling, O., 3515.
Stamp, J. T., 3683.
Steinbeck, H., 3662.
Stewart, D. F., 3630.
Stockdale, H. J., 3610.
Stover, D. E., 3551.
Stuart, J. E., 3505.
Subramanyam, P., 3595, 3597.
Süveges, T., 3483.
Sulitzeanu, D., 3515.
Sutherland, A. J., 3664.
Suttie, J. W., 3698.
Swan, J. F. C., 3767.
Swingle, K. F., 3665.
Symons, L. E. A., 3635.

Tailyour, J. M., 3498.
Tanga, G., 3526.
Taylor, A. E. R., 3547.
Taylor, J. R. E., 3593.
Taylor, P. A., 3586.
Tervola, C. A., 3466.
Teternik, D. M., 3648.
Thomas, C., 3493.
Till, D. H., 3535.
Titus, H. W., 3664.
Thienpont, D., 3575.
Thorp, J. M., 3574.
Tobie, J. E., 3645.
Tomić, L., 3525.
Torlone, V., 3607, 3710.
Touratier, 3661.
Triantaphyllopoulos, D. C., 3729.
Trifonova, T. K., 3684.
Tsaregradskaya, N. A., 3691.
Tsion, R. A., 3692.
Tsuverkalov, D. A., 3507.
Tsvunskaya, T. A., 3648.
Turk, R. D., 3643.
Turner, A. W., 3537.
Turner, H. G., 3723.
Tusing, T. W., 3707.
Twiehaus, M. J., 3459.
Tyul'panova, A. F., 3567.
Ubran, V. P., 3692.
Vaccari, L., 3536.
van Vaerenbergh, R., 3561.
Valdina, G., 3607.
Vallée, A., 3588.
Vandervelden, M., 3575.
Vasil'ev, N. T., 3653.
Verge, J., 3566.
Virat, B., 3588.
De Vleeschauwer, A., 3458.
van Vloten, J. G. C., 3771.
Vodrážka, J., 3618.
Vonarburg, H., 3468.
Vrtiak, J., 3576.
Ward, M. K., 3459.
Warden, W. K., 3489.
Walker, D. M., 3657.
Walker, V. C. R., 3586.
Waterhouse, C. E., 3702.
Weiss, D. W., 3487.
Wentworth, B. C., 3764.
Westhues, M., page 666.
Wiktor, T. J., 3699.
Wilbur, R. D., 3543.
Wilkinson, J. S., 3670.
Wills, C. G., 3589.
Wilson, J. B., 3493.
Wilssens, A., 3458.
Withrow, R. B., 3777.
Wodzicka, M., 3757.
Wolfe, L. S., 3612.
Wood, E. G., 3571.
Wood, G. E., 3523.
Wooldridge, W. R., page 666.
Worchester, W. W., 3459.
Wright, C. A., 3624.
Van den Wyngaert, M., 3491.
Yamada, C., 3490.
Yamagiwa, S., 3680, 3681
Yamane, O., 3681.
Yamashita, T., 3741.
Yashenkina, M. I., 3479.
Zaimis, E., 3712.
Zhuravel, A. A., 3722.
Ziegler, H., 3773.
Zolotov, N. N., 3527.
Zuffa, A., 3568.

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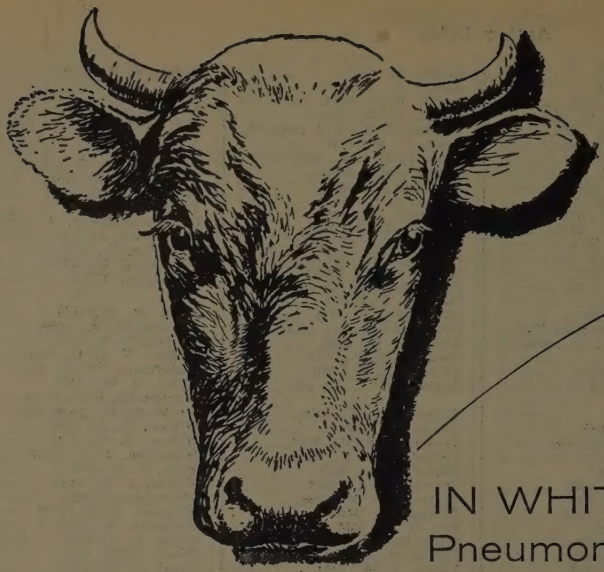

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